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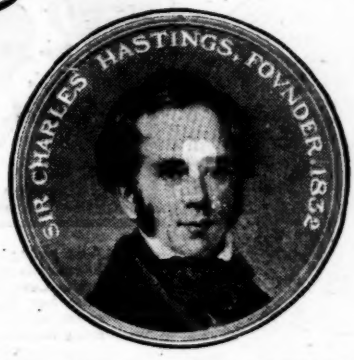

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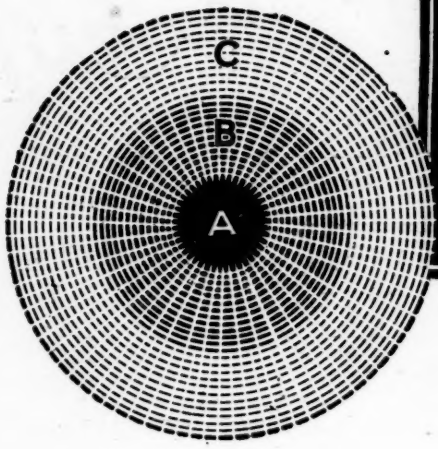

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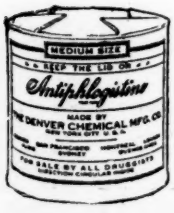

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ON

HYSTERIA AND NEURASTHENIA.

DELIVERED BEFORE THE BLACKPOOL DIVISION, NOVEMBER 14TH, 1923,

BY

ERNEST S. REYNOLDS, D.L., M.D.LOND., F.R.C.P.,

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ALTHOUGH the expression "functional nervous diseases" is a bad one (for do not all diseases during life declare themselves by alteration of function?), yet it is a well established term and is of use and should therefore not be lightly discarded; for it includes those affections in which we know of no pathological anatomic change and in which we assume that there is either some dynamic abnormality in a statically normal nervous system, or else that a lesion, if such exists, cannot be found owing to imperfect methods of examination.

Only a few years ago this group was a large one and included Landry's paralysis, myasthenia gravis, Graves's disease, chorea, paralysis agitans, epilepsy, tetanus, tetany, paramyoclonus, convulsive tics, spasmodic torticollis, habit spasm, writers' cramp, tic-douloureux, migraine, hysteria, neurasthenia, hypochondriasis, and so on. But in many of these affections definite organic changes are now recognized, and in others, even including neurasthenia, it is easy to conceive either that changes exist or that normal reflexes have become disorganized.

I wish here to deal especially with hysteria and neurasthenia. It is often assumed that the great war added enormously to our knowledge of these conditions. Certainly it led an increased proportion of medical men to take an interest in them and to study them for the first time; and this was an excellent thing. But I am not alone amongst neurologists in saying that the war revealed no manifestation of these affections in any way new to us, and no system of dealing with them which had not already been practised by those engaged in that branch of medicine. The war added very greatly to the already existing prodigious mass of literature on hysteria, neurasthenia, and the psychoses; but this is not an unmixed blessing, for it has enormously complicated a somewhat intricate subject, and, worst of all, has led to the introduction of a totally unnecessary new terminology, gradually becoming almost a foreign tongue, and often, to me at any rate, incomprehensible. Some authors, in fact, seem to have lost themselves in a forest of words. Yet in spite of this there is often an inability to distinguish between two entirely different affections—hysteria and neurasthenia—and worse still to mix up neurasthenia with the early manifestations of insanity, with which as a rule there is no connexion.

HYSTERIA.

I will define hysteria as a purely mental condition without pathological anatomic change in which diseased manifestations are imagined and assumed; and the basis of the condition is a morbid craving for sympathy or notoriety, or both. Note that it must be a morbid craving and that it must be some diseased manifestation which is assumed. Many have a craving for notoriety which they try to obtain by writing to newspapers, speaking on all kinds of subjects at every opportunity, or dressing in bizarre clothing, and in some this craving so greatly influences their conduct as to make it morbid. But this is not hysteria, as it is not a simulation of disease. So with a craving for sympathy. This may be a very real and legitimate desire, as in the case of the sick or overworked wife neglected by her husband, which exhibits itself by depression or weeping. This is not hysteria; but if as a result of such craving for sympathy some disease manifestation is assumed, then the craving is morbid and it is hysteria. In neuropathic subjects this craving for sympathy may occur without any reasonable cause for sympathy to be given, as when a servant has been rebuked ever so gently by a master, for some slight fault, and a hysterical convulsion has resulted.

It may be objected that such an assumption of a diseased condition is mere malingering. I admit that sometimes it may seem difficult to make a distinction, but it is really very wide, for I define malingering as the deliberate assumption of a diseased condition, the basis of the assumption not being a morbid craving for sympathy or notoriety, but a natural desire for personal and material gain. Malingering is most common amongst prisoners (including suspected persons awaiting trial), soldiers and sailors (especially on active service), and in persons claiming compensation for injuries. In my presidential address at the Neurological Section of the Royal Society of Medicine[1] I narrated several pairs of cases in which the manifestations were similar, one case of each pair, however, being hysteria, the parallel case malingering. Let me narrate two illustrative cases.

A nurse complained of intense pain in the spine, worse on movement, and pyrexia up to 102° F. was present. She was, of course, kept in bed, but repeated examinations revealed no cause for her trouble; the pain and irregular pyrexia continued for several weeks. I then became suspicious, took her temperature myself with two thermometers simultaneously, one in each axilla, and found the temperature normal. She recovered at once, knowing her deception had been found out. Now if this simulated illness was for the purpose of obtaining the sympathy of her attendants and fellow nurses she was a case of hysteria; but if merely to have a lazy and comfortable time in bed it was malingering.

A boy, aged 16, was brought to me suffering from total blindness which had come on rather suddenly while at a public school. No cause could be found for this in the eye itself. He had to be led about everywhere, and one of his schoolfellows had always to attend him. When he came to see me I at once noticed from his features that he was "taking stock" of me. I took him in another room away from his friends, spoke rather sharply to him, told him he could see perfectly well, and ordered him to return to the other room and walk freely about to show his friends he had recovered, and this he did. If this blindness was assumed to get off lessons, and especially if he had been found reading novels when alone, he was a malingerer; if to gain sympathy and notoriety amongst his fellows, it was hysteria.

Both in hysteria and malingering any disease may be imitated which the person has seen or heard of or read about, but never one of which the person has no previous knowledge; and the greater the knowledge of the disease the more close the resemblance will be, and the contrary. In both cases an audience is necessary; a hysterical person does not waste her substance "on the desert air." A hysterical person, and even a malingerer, will submit to all kinds of personal discomfort (even the amputation of a limb) to gain the object in view.

One fundamental difference between hysteria and neurasthenia is that the former is principally a matter of objective physical signs, the latter of subjective symptoms. The manifestations of hysteria, such as blindness, deafness, mutism, anaesthesia, loss of power, vomiting, raised temperature, and so on, can be observed and tested by others; those of neurasthenia all relate to altered feelings. But in hysteria and in malingering complaint is sometimes made of intense local pain, and it is impossible to test the truth.

As regards etiology, all persons are prone to hysteria, and it is sometimes seen in domesticated animals, such as horses and especially pet dogs craving for notice. Gilles de la Tourette[2] records several such cases. One was that of a terrier for whom his mistress got a bitch as a companion. The dog at once lost its gaiety and appetite, developed dysphagia, alteration of voice, and a progressive paraplegia without incontinence. It recovered as soon as the bitch was removed.

In neuropathic heredity this proneness is more likely to become manifest; in the well balanced person, in spite of all inducement, it will never occur. Almost no age is exempt; I have seen hysterical cerebellar reel in a boy of 7 years, and hysterical flatulence from deliberate air-swallowing in women over 60. It is, of course, commoner in women, but is also found in males (generally below the age of 20). The immediate causes of the condition manifesting itself are almost too numerous to mention: moral shocks, jealousy, insults, either real or imagined disappointments, frights, and injuries; sometimes it occurs as a complication of real disease. But in every case, if thoroughly investigated, the basis is a craving for sympathy or

notoriety, or both. In compensation cases I have seen many instances in which the condition has been produced or made much worse either by supposed or real inattention to the person at the time of injury; or later on by someone depreciating the amount of the injury received or by offering a quite inadequate sum as compensation.

The signs and symptoms in hysteria are as numerous and varied as the imaginings of the patient; and may be manifested in acute attacks lasting an hour or some days and coming on periodically, or may be more chronic and last months or years.

Alterations of sensation may lead to complaints of localized pain, sometimes in the head or spine, either the whole spine or a localized area, in the breast, over the heart, and frequently in the abdomen. Hyperaesthesia is more common than the spontaneous pain just mentioned, and these tender zones may be on the top of the head, above or below the breast, at the iliac fossae or the vertebral spines, and pressure on such zones may start an acute hysterical seizure. More frequently loss of sensation is found, variously distributed, in one limb or part of a limb or both legs, but hemianaesthesia is more common; as a rule the areas said to be affected do not conform to the anatomical distribution of the sensory nerve roots. In a limb, for instance, the limit of anaesthesia is generally a horizontal line drawn round the limb either just above or below a joint. Affections of vision are common, either total blindness of one or both eyes, marked contraction of the fields of vision, abnormal alterations of field of colour vision (instead of the normal white, blue, red, green, it may be red, blue, white, green), or colours may not be recognized or may be called by wrong names. I have never seen a bilateral homonymous hemianopia in hysteria; it is a manifestation very unlikely to be known to a hysterical subject. There may be unilateral or bilateral deafness, loss of smell or taste; speech may be affected either as aphonia or mutism or be manifested by mere gibberish.

The motor manifestations may be general or partial convulsions, local contractures, various forms of tremor, paralyses of various types, paraplegia, hemiplegia, or monoplegia. But close observation will reveal that in no case do they perfectly conform to the signs of similar affections due to organic disease; the "fit" is never a perfect epileptic fit, the spastic paralysis is never accompanied by the proper associated increased reflexes, nor the flaccid paralysis by wasting of muscles.

To put it shortly, the change, if any such exists, which produces such sensory or motor disturbances is not in any part of the brain or cord known to be directly connected with sensory or motor centres or tracts, but is a dynamic change in the highest cerebral cortex, a psychical change.

Visceral manifestations may affect the digestive system—anorexia, starvation, ravenous hunger, vomiting, flatulence from air-swallowing, meteorism (and pseudocyesis), colic, constipation. Other visceral affections may be constant cough, altered breathing, bringing up blood either by coughing or vomiting (such blood as a rule having been sucked from the gums or throat or injured tongue). About 1889, when resident in hospital, I was told that there was a girl in the surgical wards who was suffering from total loss of sensation and motion of the left arm, due to rupture of the brachial plexus from a fall against a pew in church. At the most earnest solicitations of her friends and herself, as the paralysed arm was a constant hindrance to her, it was arranged to amputate the arm at the shoulder-joint. The night before the operation I was asked to see her as she had vomited a pint of blood. She was transferred to the medical wards. The next morning, from the peculiar transparency of a thin film of the blood, I surmised it was being sucked from the gums, and on examination found this to be the case. Needless to say no operation was performed and she was discharged cured. Polyuria, dysuria, ischuria, and vaginismus are also seen.

I believe that many of the so-called trophic and vasomotor changes described in hysteria are not changes due to disease but are artificially produced. I refer to the bloody stigmata, the blisters, the gangrenes, the erythemata, and the increased temperature. If suitable and full observation be made, such tricks for obtaining sympathy can always be found out. The "blue oedema" and "white oedema" if not artificial are, I think, real vasomotor changes unconnected with hysteria.

Although hysterical subjects may possibly sometimes suffer from a self-induced hypnosis or may apparently have no recollection of what has occurred during an acute attack, or may have a simulation of loss of memory of the whole life-history previous to a particular attack, these, to my mind, are no more real than a hysterical flaccid motor paralysis. It is most important also to remember that however unconscious a hysterical person appears to be, it is probably always a simulated unconsciousness; at any rate that is my personal experience. Indeed, I go further and maintain that, however unconscious hysterical subjects may appear to be, they are really intensely "wide awake" and are watching the observers as keenly as the observers are watching them. A psychic condition of the utmost importance in hysteria is hypersuggestibility; so marked a feature is it that Babinski has suggested the name "pithiatism" (*πείθω*, I persuade) for hysteria. I thoroughly agree with him that many of the manifestations seen, such as hemianaesthesia and various types of paralysis, have unconsciously been suggested to the patient by the medical examiner, and the more they appear to be the real thing the more they have been suggested.

It would take too long to consider the differential diagnosis of each hysterical manifestation; and indeed it is not necessary to do so. All that has to be remembered is that the hysterical simulation is never perfect and never fully conforms to the anatomy and physiology of the nervous system.

Treatment also must be dismissed in a few words. In very acute cases, such as a "fit," a sudden shock, such as a strong faradic current applied to the neck or a douche of cold water on the head, may cure at once.

A boy, aged 18, was brought into hospital one night in great haste, said to be suffering from hydrophobia; he was in convulsions and there was a vague history of a dog bite some weeks before. As I was the only man in hospital who had ever seen genuine hydrophobia, I was called up to see the patient. The convulsions were of the irregular bizarre hysterical type, and when I approached the boy he "barked" at me and tried to bite me. A strong faradic current applied suddenly to his neck promptly cured him.

But in chronic cases any such violent methods do the greatest harm; isolation from friends and relations is almost essential, and the doctor and nurse must sympathize with the patient, and go fully into the life-history to discover the reason why the morbid craving has arisen. In this way the patient comes to the conclusion that at last there is someone who understands her, and when once such confidence has been gained the medical man can without difficulty persuade the patient to a normal condition. Of course, the sympathy extended must be of the persuasive, encouraging, optimistic type, and not the coddling and pessimistic type which makes things worse.

NEURASTHENIA.

Neurasthenia may be defined as a disease of the nervous system without known pathological change in which there is a persistent weakness and irritability of nerve centres due to chronic overuse of neurones and manifested by purely subjective symptoms—that is, by altered feelings.

In health, fatigue is followed by a repose during which the cell is restored, and in animals the cell changes due to fatigue have been observed—the swelling of the cell body and dissolution of part of the chromophil substance, followed during repose by restoration in size and of the chromophil particles. But if fatigue is either too severe or too prolonged such restorative changes may not occur and the altered cells become at first more irritable and more susceptible to fresh fatigue, and finally their function is lowered.

There is no common standard of fatigue for all men, a point beyond which fatigue must not go if an ordinary repose is to restore the used cell to the normal. But a sharp line must be drawn between the person with a neurotic heredity

and the average person with no such heredity. In the former, much more easily and much earlier in life, fatigue deleteriously affects the nerve cell in such a way as to make its recovery more difficult and to allow relapses to occur more easily during the rest of life. Thus hereditary neurasthenia as a rule has much more marked symptoms than acquired and is much more difficult to cure.

The immediate causes of neurasthenia are gross overwork, and especially worry. The dictionary definition of "to be worried" is "to be unduly anxious or troubled; to be in a state of solicitude, anxiety, disquietude or pain; to make one's self anxious or harassed; to fret," and inquiry in neurasthenic cases will always reveal one or more of these causes. Trauma, a frequent cause of neurasthenia, is generally one form of worry, sometimes started by shock.

Neurasthenia may affect either somatic sensations or psychic feelings. The symptoms of somatic neurasthenia are often due to increased irritability of nerve centres causing pains, not along definite nerve distributions, but in wide and somewhat indefinite areas. After listening to the tales of hundreds of neurasthenics it would almost seem as if their viscera had become as sensitive as their skins; they can apparently feel their brains working, their hearts beating, and their alimentary canals doing the work of digestion. Other symptoms seem to be due to a lowered irritability of nerve centres, as shown by lack of power of attention or by great bodily fatigue. Headache is exceedingly common and is constant when it occurs; it may be a feeling of weight on the vertex with dragging pains up the back of the neck, sometimes coming forward to the root of the nose or round to the temples, or is like a tight band round the head, or a tight skull-cap; sometimes the scalp is very irritable, at others the pain is across the brows and behind the eyes. Sometimes the pain is as if inside the brain, which is described as "stirred up" or "screwed up," as if something were moving in it; or at other times as if the head felt empty. Other painful sensations are found in the spine, either the whole spine or in some definite locality —spinal irritation—cervical, dorsal, lumbar, sacral, or coccygeal (coccygodynia); not infrequently pains radiate down the limbs or round the chest or abdomen, sometimes, indeed, in so definite a form that it may be difficult at first to exclude gross organic lesion; or there may be paraesthesiae (creepings, tinglings, burnings, etc., down the limbs); but real anaesthesia I have never met with.

Neuro-muscular asthenia is common, and is described as a feeling of lassitude and fatigue, often on waking in the morning, improving after a meal, and getting worse after any extra effort, mental or bodily.

The special senses may be affected. There may be "floating specks" in the vision, a feeling of burning in the eyeballs, an inability to read for more than a few minutes, a feeling of grit under the eyelids. There may be noises in the ears, continuous or pulsating, or distress caused by loud noises; vertigo sometimes occurs.

Each heart beat may be felt and may, indeed, be painful, and there may be tachycardia. Hyperaesthesia of the alimentary tract, if I may so describe it, is the cause of a very large number of symptoms—the irritable or painful tongue, the irritable pharynx, pain and spasm of the oesophagus, discomfort and pain after food, eructations, flatulence, a sense of fullness, sometimes a loss of appetite with wasting; sometimes food is not taken because though hungry the patient fears the discomfort of food in the stomach; the tongue is often furred and flabby and there may be constipation; sometimes the symptoms relate more to the bowels than the stomach, the discomforts being then more in the middle or lower zones of the abdomen.

In the genital system there is often loss of sexual appetite, or sexual impotence; burning pains in the urethra, in the testicles, the spermatic cords, or the perineum.

A consideration of the cerebral symptoms will lead on to the psychic symptoms of so-called psychasthenia, much more common in hereditary than in acquired neurasthenia. Many neurasthenics sleep quite well, but in others there is either intense insomnia or disturbed sleep; sometimes they cannot start to sleep, at other times they sleep at once, but only for two or three hours, and are then awake for the rest of the night. Complaint is often made of loss of power of mental concentration, of inability to attend to business, of indifference to affairs in general with loss of memory for recent events; then come states of anxiety, mental depression, fear of going insane. The genuine neurasthenic very rarely goes insane, but some, especially those with a family history of insanity, do, and it must be remembered that some cases of genuine insanity (failure, as Mercier said, of adjustment of self to surroundings, which is manifested by disorder of conduct) actually start with purely neurasthenic symptoms. Then there is the irritability of temper, the intolerance of loud noises, the general impatience of the tired-out man. There are constant "doubtings," often about the most trivial circumstances, and these lead on to the many "phobias"—the fear of closed places, or wide open spaces, the fear of disease or of contamination by persons or objects, the fear that "something is going to happen."

Neurasthenia is often classified according to its prominent symptoms — cerebral, spinal, cerebro-spinal, dyspeptic, cardiac, genital, and so on.

The diagnosis is easy when the affection is widespread, but it may be difficult when the symptoms are confined to special organs, and it is in these cases that so many mistakes are made and in which so many useless and often very harmful operations are done. It would be interesting to know how many operations for gastric and duodenal ulcers, for gall stones, for appendicitis, for kidney trouble (including movable kidney), for gastroptosis, for enteroptosis, for ovarian and uterine affections, have been performed on people suffering from neurasthenia with no causative local affection of any of the organs mentioned. I have personally known some hundreds of such cases. These mistakes may often be avoided by taking a large view of the patient's condition and paying less attention to the symptoms complained of. When a patient comes to see me complaining of some altered sensation, the cause of which is somewhat doubtful, I encourage him to talk and then "sit tight," and if it is a neurasthenic it will not be long before a whole host of other complaints, not anatomically or physiologically connected with the original one, will be poured forth; and then further inquiry will give the cause as being some form of worry or stress. In all modesty I would suggest that in these doubtful cases it would be well if the surgeon before operating would ask the advice of his physician colleague.

The prognosis of neurasthenia depends on the type. The hereditary neurasthenic may improve from time to time, but will have relapses for many years, although as age advances they may lessen. The patient with acquired neurasthenia very frequently recovers; if the cause is recent recovery may be only a matter of a few weeks or months, but if of older date with constant repetitions of the cause it may be a matter of one or more years.

Treatment is extraordinarily difficult. Each case has to be dealt with on its merits. The cause must be sought out if possible and removed if possible; the full details of the patient's life and work must be investigated and altered if necessary; things must be explained to him in detail, and an explanation given of the cause of his various symptoms. Frequent interviews and long talks are often necessary, so that to deal satisfactorily with these patients is one of the most tedious and difficult tasks, involving the greatest patience and sympathy. Very frequently a total change of surroundings is necessary, and the choice of a suitable place is difficult. Some patients require total quiet, such as a lonely country or seaside resort miles from a station, some a sea voyage or foreign travel, others require the distractions of London, and others interesting occupation on a farm. It is very necessary to treat symptoms medicinally—the insomnia, the dyspepsia, the headache, and so on—and to build up the body tissues if they have unduly wasted.

Hypochondriasis.

Hypochondriasis is a condition so definite that it should be considered apart from neurasthenia. It is a psychical change so closely allied to insanity that if severe it is

inseparable from it. In it the patient does not merely complain of altered sensations and feelings, but has gone a stage further and translated these into terms of definite disease, from which he is certain he is suffering, and his conduct is modified accordingly. Many patients have an idea that they may have syphilis or cancer, or ulcer of the stomach, and consult their doctor on this account. But this in itself does not constitute hypochondriasis, for after adequate examination and explanation they may be convinced that their fears are groundless. It is the person with the fixed idea, unalterable by argument, that he has some definite disease and will not therefore take food, or only certain foods, and will not touch other persons for fear of contaminating them, or will not walk lest he suddenly drops down dead from heart disease, or who spends his time constantly examining some part of his body which he considers diseased, or constantly washes and changes his linen because he thinks he is verminous—that is the true hypochondriac. It is in some cases a truly terrible affection, and is often as incurable as a case of chronic delusional insanity.

Traumatic Neuroses.

It would take too long to discuss traumatic neuroses in all their aspects, complicated and increased as they have been by the Workmen's Compensation Act, but a few words are necessary. No signs or symptoms are found in these cases differing from those mentioned in my previous remarks. The manifestations may be those of malingering, of hysteria, of neurasthenia, of hypochondriasis, or even of true melancholia. The only peculiarity is that after trauma it sometimes happens that there is a mixture of hysteria and neurasthenia with some malingering. According to legal decisions hysteria and neurasthenia (including, of course, hypochondriasis and melancholia) are psychical or physical changes and have to be compensated. But malingering, being pure fraud, gets no compensation, and the great difficulty is to prove that the case is one of pure malingering. Sometimes the doctor can discover this himself, but at other times it can only be proved by outside evidence. For instance, a man after injury may have paraplegia, not organic, as it does not conform to this, but apparently hysterical. If, however, there is evidence that when not under observation so far as the man knows he is seen to walk and run in a perfectly normal manner he is an obvious fraud.

Psychical shock producing neurasthenia may occur without physical injury. A lady in a tramcar saw a following car approaching too rapidly and thought the guard would be killed, but beyond a very slight impact of the cars nothing happened. But the lady got out of the car in a state of fright, fainted, and was afterwards at home suffering from profound neurasthenia for weeks, and was given heavy damages at the assizes.

Again, a man is in very great danger owing to an alarming accident, say, of a falling crane crushing him to death; perhaps he escapes with a bruised foot which soon recovers, but he develops neurasthenia lasting many months. And it is not uncommon for some simple injury, say, of a finger, to be followed by hysterical paralysis of sensation and motion of the same arm. In these cases, although the original slight injury soon heals, compensation must be paid so long as the neurasthenia or hysteria persists.

Finally, I would say that although after trauma the neurasthenia is due to a molecular nerve change similar to those of an ordinary acquired neurasthenia from business worry which recovers perfectly in weeks or months, yet I think that in cases of more severe injury due to falls from heights or injuries to head, and also if the accident has been a very terrifying experience (such as being whirled round a revolving shaft), it is possible for the nervous molecular changes to be so intense that recovery never occurs, in spite of full compensation having been paid. The man is "never the same as he was," and occasionally passes into melancholia and sometimes commits suicide.

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SOME APPLICATIONS OF PHYSIOLOGY TO MEDICINE.

III.—BLOOD PRESSURE AND HEART ACTION IN SLEEP AND DREAMS:

THEIR RELATION TO HAEMORRHAGES, ANGINA, AND SUDDEN DEATH.*

BY

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(From the Physiological Laboratory.)

THIS is an important, and in some of its aspects an almost unexplored, field of study, with an obvious bearing on many questions. Precise data on the subject are naturally somewhat difficult to obtain. The present paper contains some results of slowly accumulating observations carried on by the writer as opportunities presented themselves over a long series of years.

Changes in Normal Sleep.

The slowing of the pulse rate (noted by Galen) and the respiration during sleep has long been known to be accompanied by a lowering of bodily temperature, a great reduction in metabolic activity and heat production, depression of reflexes, diminished secretion, etc. There is general agreement as to a definite lowering of the systolic blood pressure, varying in different conditions and as recorded by different observers, but often amounting to 15 to 30 mm. Hg at the end of two hours' sleep; the pressure gradually rises in the later portion of the night's sleep. Greater reductions have been noted in persons with high pressures in the daytime. Thus some years ago Brooks and Carroll in 39 "hypertonic" subjects with an average systolic pressure of 204 mm. found a fall of 44 mm. after two hours' sleep; at the moment of waking it rose 22 mm. from the level present in sleep. More recently, in the last year or two, C. Müller in normal persons found the systolic pressure to be down to 94 mm. in men and 88 mm. in women during sleep, after a small dose of veronal. Blume, in men and women with moderate day pressures, recorded falls of 15 mm. and 21 mm. respectively, while in those with high day pressures the falls averaged 31 mm. and 39 mm. Much importance has been attached by some writers to this reduction of pressure; it has even been regarded, though on very insufficient grounds, as the determining cause of sleep.

It must be borne in mind that in the recumbent position a fall of aortic pressure would be necessary to prevent the pressure in the cerebral arteries from being higher in the horizontal than in the erect position—from the influence of gravity, the hydrostatic factor of the weight of the column of blood between the levels of the heart and the brain. Allowance for this factor in the recumbent posture cuts down the observed lowering of arterial pressure to a comparatively small amount, probably much too small to play the potent rôle that has been ascribed to it in the production of sleep. Further, the crude analogy of unconsciousness caused by an arrest or sudden great diminution in the blood supply to the brain cannot be regarded as valid when applied to the induction of the normal process of sleep.

Diminished vascularity of the brain substance during sleep has been described by various writers (Durham and others) on the ground of direct observations on exposed portions of the brain surface. A similar change has been inferred from the plethysmographic records obtained by Mosso and his followers, who found evidence of an increased volume of blood in the limbs (arm, etc.) during sleep, and assumed this to be attended by lessened vascularity of the brain, the converse conditions being present after awaking. But this hypothesis has to be revised in view of Leonard

*A communication on this subject was made to the International Physiological Congress at Edinburgh on July 26th, 1923. Part I of this series was published on January 13th, 1923 (p. 51), Part II on August 11th, 1923 (p. 215).

Hill's work establishing the practical accuracy of the old Monro-Kellie doctrine that the amount of blood within the skull is a constant quantity, whilst its distribution in arteries, capillaries, and veins respectively varies in different conditions. Weber's more recent work indicates that when there is less blood in the limbs there is more in the abdomen, not in the brain.

Plethysmographic observations have clearly shown responsiveness to stimuli during sleep, inducing alterations in the volume of a limb and showing certain changes in the distribution of the blood in the vascular system. But such observations give no information as to the state of the aortic blood pressure, upon which the pressure in the cerebral arteries depends.

Relations of the Period of Sleep to Some Diseased Conditions.

In accordance with the accepted view that the vital activities, as indicated by heart action, respiration, blood pressure, temperature, and general metabolism, reach their low-water mark in the early hours of the morning, it is easily intelligible that death from illnesses involving progressive exhaustion and a gradual running down of the machinery of life should often take place in that period. Statistics are available which bear this out. Thus Schneider (Berlin), in a total of nearly 58,000 deaths, found that deaths were most common between 4 and 7 a.m. Watson and Finlayson (Glasgow), dealing with records of nearly 14,000 deaths, fixed the highest mortality between 5 and 6 a.m.

Many phenomena of disease, aggravation of morbid conditions and symptoms in the night, can be brought into relation with the general lowering of vital activities during sleep—for example, some respiratory troubles which may in some cases be associated with the depression in respiration naturally occurring in that period, the reduced sensitiveness of the respiratory centre to the normal excitation by CO_2 with the consequent modification in the state of the blood, heightening of the grade of acidosis which may be present, development of Cheyne-Stokes respiration, etc., often associated with attacks of severe dyspnoea, etc.

Incidence of Haemorrhages, Anginal Attacks, and Sudden Death in the Night.

In contrast with the associations of depressed functions during sleep as affecting some of the manifestations of disease there is another class of phenomena for which a different interpretation is required, for they obviously do not lend themselves to explanation by the lowered vital activities of nightly rest and sleep.

In connexion with the subject of haemorrhages of various kinds and their times of occurrence and mechanism, questions arise. The time incidence of many vascular ruptures is naturally accounted for by the conditions prevailing at the moment of their occurrence—rise of blood pressure and increased stress on the walls of the vessels determining rupture at the weakest part—for example, muscular effort, the influence of gravity in certain postures, abdominal straining, etc.

But why should a weakened vessel give way during the period of nocturnal rest and sleep, since a lowered blood pressure is naturally protective against rupture? Why cerebral haemorrhage should frequently occur in the night and in sleep is a question that was asked long ago by Sir Samuel Wilks and apparently never answered. In view of the lowering of blood pressure and a diminished blood flow through the brain in sleep, why should a cerebral vessel burst at that time? A similar question has to be dealt with in the case of pulmonary haemorrhage, which, as is well known, is frequently nocturnal in its incidence. The same applies to gastro-intestinal haemorrhages.

It is, of course, a matter of familiar knowledge that true anginal pain occurring in the daytime is commonly associated with exertion or excitement involving raised blood pressure and an increased call upon the heart, the pain diminishing or passing off with cessation of the muscular effort or emotional disturbance, reduction of the blood pressure by amyl nitrite, etc. But it is also well known that anginal pain sometimes seizes the patient in the quiet of the night, awakening him from sleep. What is to be put down as determining the onset in these cases?

Again, we know that sudden death in the night is not rare, sometimes coming thus to persons who have shown little or no evidence of serious departure from the level of their ordinary health, or at least nothing to warrant the expectation of so sudden a termination. In a former paper considerations were advanced in support of the view that the usual mechanism of such deaths is to be found in fibrillation of the ventricles, occurring in a heart which has become specially susceptible as a result of defective coronary blood supply, degenerative changes, toxic influences, etc. But, granted such predisposition, what is the exciting cause that precipitates the sudden and unforeseen disaster in the night-time?

Recognition of Two Different Conditions in Sleep.

The results obtained in the present investigation lead to the conclusion that in considering the subject of sleep we have to deal with two distinct conditions, which have strikingly different associations as far as nervous, circulatory, respiratory, and other functions are concerned: (1) undisturbed or sound sleep, attended by lowering of blood pressure, heart and respiratory rates, etc., and (2) disturbed sleep, modified by reflex excitations, dreams, nightmare, etc., sometimes accompanied by extensive rises of blood pressure (hitherto not recognized), increased heart action, changes in respiration, and various reflex effects. The circulatory changes in disturbed sleep are sometimes so very pronounced that it is somewhat remarkable that they should so long have escaped observation. So far as the present writer knows, the occurrence of marked rises in blood pressure during sleep has not even been suggested—apart from the fact that no actual measurements have been recorded. No doubt paucity of opportunities and difficulties in observation have stood in the way. But the considerations as regards the occurrence of haemorrhages, etc., in the night (stated in the earlier part of this paper) give distinct indications of the probability of important blood pressure changes being present in some instances.

Disturbed Sleep.

In connexion with the circulatory and the other phenomena of disturbed sleep there are various categories with regard to the degree in which the subject is able to recall his dreams or is conscious of the disturbances after awaking.

1. There is no recollection of the disturbed sleep or dreaming condition, though the presence of such was clearly shown by observations on the sleeper—occurrence of muttering, talking, groaning, movements of the face, fingers, etc.; reflex disturbances were evidently active in pronounced degree.

2. On awaking there is a sense of the sleep having been uncomfortable and troubled, but there is no recollection of dreaming having occurred.

3. The fact of dreaming is remembered, but not the definite sequence of the dream.

4. Vivid dreams remembered in great detail.

In all the above categories cardio-vascular disturbances, etc., have been recognized in more or less marked degree. These disturbances disappear at various periods after awaking—often in a variable number of minutes.

Distribution of the Changes in Disturbed Sleep.

The incidence of the recorded disturbances upon the various systems varies widely in different instances.

The heart's action may be specially affected by the impinging of nervous impulses on the cardiac regulating centres in the medulla, etc. There may be much acceleration of the pulse with comparatively little elevation of arterial pressure; there may be a strong cardiac impulse, with or without sensations of palpitation.* On the other

* In contrast with the slowed pulse rate which is normal in the small hours of the morning, there is sometimes an acceleration at this period, apart from the development of abnormal rhythms, true tachycardias, etc., and without evidence of the more extensive disturbances of blood pressure, etc., described in this paper. Such acceleration is probably ascribable to reflex influences which have become operative during the preceding period of sleep in the earlier part of the night.

hand, the arterial tone may be mainly influenced, vaso-constriction being chiefly instrumental in causing a large rise of pressure, attended in some instances by moderate or slow heart rates; in accordance with Marey's law the high blood pressure acts by increasing the controlling influence of the vagus centre over the rate of beat. A strong cardiac impulse and a large pulse wave may be prominently in evidence. Again, both heart and arteries may be markedly influenced, giving a high blood pressure with strong and rapid cardiac beats, powerful cardiac impulse, etc.

The respiration is sometimes much altered in the way of augmentation or irregularity, but there is no constant association between these changes and the circulatory disturbances; there may be marked respiratory changes while there is little or no evidence of circulatory alteration. Long ago Hammond described notable respiratory disturbances in dreams while describing the pulse as being unaffected, except in regard to slight irregularity ascribable to the respiratory alterations. In addition to the circulation and respiration the disturbances of troubled sleep may extend, in varying degree, over other systems, somatic and visceral, as evidenced by sweating, tremors, vomiting after awaking, etc. It is obvious that such disturbances acting on various functions in different ways may be responsible for important effects in some conditions of disease.

A notable feature (remarked long ago by Hughlings Jackson) is the absence (apart from somnambulism) of large movements of the limbs, etc., even during dreams of vigorous exertion, while movements of fingers, lips, etc., may occur, contraction of distal muscles being practicable while proximal ones fail. It would seem that impulses from the cerebral cortex can sometimes reach the medullary centres (cardiac, respiratory, vasomotor, sweat, etc.) while failing to activate the large muscles of the limbs even during dreams with strong emotional content.

The Dreaming State in the Dog.

The phenomena observed in the human subject are evidently paralleled by what is recognizable in the healthy dog during dreams of hunting, etc., with the familiar movements of toes and paws, tail and ears, biting action, series of subdued barks, etc. The heart is often rapid and irregular with inhibitory pauses, bouts of acceleration, etc., while a violent cardiac impulse may be perceived; respiration is frequently hurried and irregular, with gasps, etc. The knee-jerk may be increased—as Lombard noted in man during a dream of active movement. It has not been found practicable to get actual measurements of blood pressure that are satisfactory, for disappearance of the changes present in the dreaming state is very quick when the animal awakes. But the finger on an artery has sometimes given unequivocal evidence of a rise of blood pressure.

Some Characters of the Nervous Disturbances.

The extent and intensity of the functional disturbances which may be set up during troubled sleep and the dreaming state are remarkable, though quite intelligible in view of the diminution or suspension of the control normally exercised in the waking state by higher neural mechanisms, which come to be more or less completely in abeyance during sleep; released from such control the lower mechanisms are apt to give exaggerated responses to stimuli which would have comparatively little effect in the daytime. Thus afferent impulses (somatic or visceral) which would have only slight and quite different effects in the waking state may call forth complex and pronounced reflex responses. The influence of afferent impulses in provoking and shaping the course of dreams need not be emphasized. Potent in this respect are impulses from the viscera which in the waking state would only be productive of slight sensations of discomfort—headache, nausea, etc.; in sleep elaborate responses may be set up, especially when unrestrained emotional processes are called into action with their resultant effects on both cerebro-spinal and autonomic innervation—excitation of sympathetic, etc. Such emotional excitation is apt to reach a high grade of intensity from lack of the balance and restraint normally exercised by the fully active mechanisms of ordinary consciousness, especially by those subserving the higher levels of mental function acquired through experience after the infantile stage of life.

The suddenness of development of the functional disturbances in blood pressure, heart action, etc., in the dreaming state is an important feature. As is well known, most dreams are of very brief duration as regards the actual time occupied, a number of seconds or a very few minutes often sufficing for a dream which is subjectively a long and complicated one—for example, an apparently long and varied dream has been recorded as running its course between the beginning and the ending of a clock striking midnight. The associated functional disturbances may thus be set up with unusual abruptness, as compared with the waking state—as, for instance, in ordinary muscular exercise. It follows that there is little or no time for the coming into play of the various adjustments and compensations in the circulatory and respiratory systems, etc., that are operative in muscular exercise; in the latter the rise of arterial pressure is checked by gradual dilatation of the vessels of the skin and the working muscles, while the heart accommodates itself with the aid of increased coronary blood supply, etc. Thus the blood pressure rise in certain dreams may be both large and steep in ascent. The call on the heart, through its nervous apparatus, etc., may also be a sudden one.

Influence of the Recumbent Posture.

So far as the rupture of a weakened cerebral artery is in question the hydrostatic factor in the recumbent position is an added consideration; the weight of the column of blood between the levels of the head and the heart, which reduces the cerebral artery pressure in the standing position, is now largely out of action; with a given aortic pressure the pressure in a cerebral artery is naturally higher by a very appreciable amount (varying according to the elevation of the head) in the recumbent than in the erect posture, and the danger of a cerebral haemorrhage during a rise of aortic pressure is necessarily increased.

Observations on Blood Pressure, etc.

The subjects examined were persons mostly between the ages of 30 and 65, all, so far as was known, without organic disease of the circulatory system. The observations were made quickly after the awakening of the subject, the apparatus having been kept in readiness for immediate use. Systolic blood pressure was measured by the auditory and tactile methods, diastolic pressure by the auditory method. On occasions when no measurements could be made convincing evidence of the occurrence of extensive changes was obtained by ordinary digital examination of arteries, palpation of the cardiac impulse, etc. The following are some of the examples of the sort of observations made and the nature of the results obtained.

Subject No. 1.

The effect of walking upstairs (twenty steps) was compared in this person with the disturbances occurring in sleep. The pulse rate was raised from 80 to 90-95, the systolic from 120 to 140, and the diastolic pressure from 80 to 90; the observations were made while the ascent was being continued, not after its cessation. Ordinary walking exercise on a fairly level road caused comparatively slight changes in the heart rate and the blood pressure. In the same subject some days previously atropine (1/50 grain hypodermically) raised the pulse rate from 81-82 to 130, with systolic and diastolic pressures of 135 and 75-80 respectively, as compared with 115 and 70 before atropine. Abdominal straining (expulsive efforts) raised the systolic blood pressure only a few millimetres.

It is evident that in this individual the stress on the circulatory system was vastly greater during such disturbed sleep as is described above, than under the conditions of ordinary easy life with avoidance of sudden violent effort, emotional excitement, etc. The actual height of pressure attained during the disturbed sleep was, no doubt, decidedly higher than as measured after awaking when it is declining with some rapidity.

Hour of Observation.	Pulse Rate.	Systolic Pressure.	Diastolic Pressure.	Pulse Pressure.
1.0 a.m.	75			
7.0	62			
8.0	65	110	75	35
8.20 breakfast (in bed)				
8.50	75			
9.15	68–70	175	75	50
9.30	70	125	75	50
9.45	70	125	75	50
11.30	70	125	80	45
12 noon. Subject got up				
12.25 p.m. Sitting quietly	85			
12.55	81			
12 midnight. In bed after first sleep (somewhat disturbed)	70	140	80	60
Next morning—				
6.0 Subject awoke with feeling of disturbed sleep but no memory of definite dream. Arterial sounds (auditory method) very loud and the murmurish phase very pronounced.	62	182	105	77
Another reading two or three minutes later	—	165	95	70
6.15	60	145	90	55
6.0	58–60	115	70	45
8.0	60	130	80	50
10.20	76	120	70	50

During the day the pulse rate was generally 76 to 80.

Subject No. 2.

Subject in bed in afternoon. While asleep he had lain on the right side with the right arm pressed on by the head so that the right radial pulse was abolished. The left radial pulse was found to be very fast and the artery large and strikingly tense, immediately after awaking; these unmistakable evidences of an extensive rise of blood pressure speedily passed off. The sleeper reported having been under the influence of a pronounced nightmare, with the illusion of his lying prone near the door of a house while he heard a visitor approaching along the drive; he had vivid and distressing sensations of ineffectual efforts to rise. The nightmare was no doubt determined by the posture, the pressure on the arm, and the ischaemia caused. After awaking numbness and tingling were felt in the right hand, while the radial artery became very large and the skin flushed—evidently after-effects of the ischaemia.

Subject No. 3.

A subject, who had some symptoms of gastro-intestinal disturbance but was pursuing his usual avocations, had in the course of a night of broken sleep a dream in which he felt lively resentment at the irritating conduct of an official on a public occasion —a vivid dream but not distinctly a nightmare; there was no sense of fear, oppression, ineffectual effort, etc. On his awaking it was found that there was no sense of palpitation, no sweating, and no subjective alteration in respiratory sensations; no marked change in the respiratory movements was observed. But the cardiac impulse was greatly increased in force and felt over a larger area than usual in this person. The pulse was accelerated from a normal rate of 70-80 to 90-95. But the most notable change was a greatly raised blood pressure with an extensive pulse pressure, as shown by digital examination of the radials; the arteries were large and tense, obliteration difficult, and the range of the pressure variations at each beat palpably large. When examined fifteen minutes later these altered conditions were practically gone.

Some hours later another dream took place, the details of which were not clearly remembered. Similar phenomena, in somewhat less pronounced degree, were recognized; these virtually disappeared in a few minutes.

In one dream systolic pressure rose from 130 to over 200.

Emotion, Motor Effort, and Gastro-intestinal Disturbance.

While the most striking cardio-vascular effects are naturally present in dreams with a strong emotional content, it is to be noted that a vivid dream of active movement (cycling, for example) without sensations of nightmare, etc., may cause a pronounced rise of blood pressure. Thus in an instance of this kind the pulse tension was greatly increased and the pulse pressure was extensive while the heart rate remained at 72-75; the elevation of blood pressure was evidently brought about mainly by vaso-constriction.

It is noteworthy that the amount of disturbance (circulatory, respiratory, etc.) associated with vivid and alarming dreams varies greatly in different individuals and even in the same individual under different conditions; the effects are sometimes remarkably slight in the case of dreams that are at other times attended by very pronounced effects of the kinds described above. There is reason to believe that the presence of some gastro-intestinal disturbance at the time may sometimes play a part in facilitating the development of the more marked effects on circulation, respiration, etc.

Dangers of the Circulatory Disturbances.

These cardio-vascular changes, involving sudden demands on the heart's power with great alterations in its rate and force and a steep and sometimes very extensive rise in blood pressure, are quite harmless in the healthy individual. Vivid dreams, involving hurrying to catch trains, etc., with failure to do so, are common in many persons and sometimes persistently recurrent — with no injurious consequences apparently. But the case is obviously very much otherwise with a damaged vascular system, life going on under conditions which afford only a narrow margin of safety. There may be a myocardium abnormal in certain functional respects, whether or not these be attended by recognizable structural alterations with or without obvious coronary lesions, giving a susceptibility to ventricular fibrillation, or, on the other hand, a defective arterial tree with localized weakenings (by miliary aneurysms, etc.) in the brain vessels, tuberculous damage in the lungs, ulcerative conditions in the gastro-intestinal tract, etc., where haemorrhage may readily be determined. In a heart susceptible to fibrillation a sudden call on the heart during muscular exertion and excitement in the waking state is often fatal; in the disturbed conditions of sleep and dreaming a similar mechanism is sometimes brought suddenly and strongly into action—diminution of vagus control and, especially under emotional stress, stimulation of the cardiac sympathetic together with a high blood pressure—conditions which favour ventricular fibrillation.

A possible discharge of adrenaline into the circulation under emotional excitation also comes into question, though the importance of such discharge or its existence has been denied by Stewart and Rogoff, in opposition to the well known work of Cannon and de la Paz. The time incidence of attacks of anginal pain may obviously be determined by similar conditions.

CONCLUSIONS.

It is clear that the foregoing facts must be taken as profoundly modifying the simple conception of night as the time of rest, and sleep as a condition in which quiescence prevails and recuperative changes go on, restoring the bodily and mental capacities which have become more or less reduced at the end of the hours of work and wakefulness—a period of repose also attended by sedative and beneficial effects on many morbid conditions. This conception, while true as regards undisturbed or sound sleep, has to be qualified by the consideration that night and sleep are occasionally the season of acute reflex and emotional disturbances which, in the peculiar conditions present, induce very pronounced effects on the circulatory system, throwing a formidable strain upon its weak points, whether these be cardiac, with susceptibility to fibrillation or anginal pain, etc., or arterial, with risk of rupture.

In this way the individual may, during the nocturnal period of assumed repose, be subjected to suddenly developed stresses, as estimated by the rise of blood pressure (even as measured after awaking when it is falling) and the evidences of increased heart action, far beyond what is involved in ordinary muscular exercise gradually initiated—for example, walking, cycling, slow ascent of stairs, straining, or mental excitement in certain degrees. Thus haemorrhages, the

onset of anginal attacks, and other disturbances in the night can be readily accounted for; also sudden death, probably due to ventricular fibrillation in most instances.

In the light of these observations it is easy to understand how in certain circumstances death may come like a thief in the night to a susceptible person living with circulatory conditions that approach the danger line, though these conditions may, in favourable circumstances and barring fresh developments, be compatible with many years of moderately active life.

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AN INVESTIGATION INTO THE EFFECTS OF THE ARSENOBENZOL TREATMENT OF SYPHILIS ON LIVER FUNCTION.

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ALTHOUGH salvarsan and its substitutes and modifications have now been in general use for a considerable number of years, syphilologists are not yet in complete agreement upon the method of using these remedies in the treatment of syphilis. Some, for example, rely entirely or principally upon salvarsan as a curative agent; others deem that it should be employed in conjunction with mercury or with the new bismuth preparations. There can be no doubt, however, as to the advantages of this drug; but it is not one to be used recklessly, and of late, since its more extensive use, and since its employment in larger doses and in a greater number of injections, certain untoward results have become familiar to those working with it. Modern methods have largely succeeded in abolishing, or at least diminishing, the immediate dangers or inconveniences, such as fever; but there still remain two important and serious consequences attributable to its administration—arsenical dermatitis and jaundice. Foulerton was among the first to call attention to the possible harmful effects of the arsenical compounds on the liver, regarding fatal cases of poisoning by the arsenobenzol compounds as essentially identical with poisoning by chloroform, ether, T.N.T., and phosphorus. In his experiments carried out with arsenical compounds in rabbits he found an interstitial hepatitis with injury to the parenchyma cells, and a nephritis in addition to the hepatitis. Many other workers have adverted to the possibility of serious toxic effects on the liver tissues, and indeed it would appear that these, with dermatitis, may now be regarded as being among the most common of the ill effects following the administration of the drug.

In considering the treatment of syphilis it has clearly to be kept in mind that cure may only be expected with any degree of confidence in the earlier stages of the disease; therefore in this early stage the powerful remedies available may be pushed to the degree of tolerance with justification. The problem presented to the dermatologist is twofold: first, he has to determine what amount of arsenical compound is required to give in the early or curable stage the best chance of cure; and, secondly, having decided this, he has further to consider whether this amount can be administered without risk of injury to the individual.

To the first part of the problem attention was paid by one of us and Kennaway in an earlier series of cases, and it was found that a series of ten injections of novarsenobenzol, amounting to 8.7 grams, satisfied the requirement in most cases—provided that treatment was subsequently continued with mercury. In view of the statements by competent observers as to the possible harm to the liver tissues from such a dosage, the present investigation was undertaken.

A series of 57 patients in different stages of disease, undergoing treatment with novarsenobenzol, was investigated, the liver functions being tested by methods to be described. The facts as ascertained by us are set out briefly in Table I. It will be noted that the examinations were carried out both during and at varying intervals after salvarsan administration. This was done in order that the harmful effects, if any, could be determined not only during the period when the arsenical compound was being administered, but also at varying periods afterwards, when delayed harmful effects might occur.

The investigator of hepatic function is confronted at the outset with certain physiological facts which make evident to him the difficulty of his task. Thus, the work of F. C. Mann has shown that four-fifths of liver substance can be removed from an animal without occasioning any apparent adverse symptoms, apart from some temporary shock inevitable where so extensive an operation has been performed. If, however, more than four-fifths of liver substance be removed, the animal develops convulsions, which may be prevented, at least for some time, by the intravenous administration of glucose solution. This fact is extremely important; it corroborates the common observation that even in cases of massive secondary carcinomatous deposit in the liver the only symptom of hepatic disturbance may be jaundice. There is evidently what may be termed an enormous "liver reserve," and this prevents any known test from being entirely satisfactory, because, unless a very large amount of liver tissue be put out of action, a single test may fail to give a positive reaction. We have attempted to overcome this difficulty by using a number of different tests.

Tests of Liver Function.

The tests that may be employed to determine liver function naturally fall into certain groups which are designed to investigate particular functions. Owing to the nature of the chemical reactions in some of the tests it is often extremely difficult to read the result accurately; we have therefore selected the following as being the most likely to give reliable results. They are those depending on biliary function and those depending on the lipase content of the blood.

The first group is concerned with the investigation of bile pigments and their precursors, urobilin and urobilinogen. We may here briefly summarize the metabolism of these substances. As is well known, the liver secretes bilirubin and biliverdin into the intestines; there these pigments meet the intestinal bacteria and are by them converted into various substances, the most important, from the point of view of the tests employed, being urobilinogen. Some of this chromogen is absorbed into the blood stream, and is then picked out by the liver cells, converted into bile pigment, and re-excreted with the bile. A very little passes out into the urine. But if there be any damage to the liver cells this property of converting urobilinogen into bile pigment is lost, and therefore urobilin accumulates in the blood and is excreted in excess in the urine. Hence it follows that any excess of urobilin in the urine points to damage of the liver cells, and the demonstration of such an excess may be accepted as evidence of liver defect. This phenomenon precedes the appearance of bile pigments in both blood and urine. The details of the tests employed to detect this substance are given later.

The tests depending on the lipase content of the blood are based upon observations by Whipple, who showed that after chloroform poisoning the lipase concentration of the serum rose, and that this increase could be prevented if the liver was "cut out" of the circulation. He suggested the estimation of blood lipase as a test of hepatic function, and this method has been used in this country in especial by Mackenzie Wallis.

The technique employed in the different tests is as follows:

Tests for Urobilin and Urobilinogen.

Ehrlich's aldehyde reaction: To 5 c.cm. of urine two drops of a 3 per cent. solution of paradimethylaminoazobenzaldehyde in 50 per cent. HCl are added. If the test be positive, the resulting mixture becomes deep red. Occasionally it is necessary to warm the solution to bring about the reaction. This test.

TABLE I.

Case No.	Sex.	Age.	Total N A.B. (Grams).	Interval between First Injection and Test.	E. A.	U.	H.	I.	Gm.	F.	L.	Condition.
163	F.	22	6.6	4 years 8 months	−	−	−	−	−	−	−	Secondary syphilis.
392	F.	25	12.45	4 years	−	−	−	−	−	−	−	Secondary syphilis.
529	M.	37	9.3	2 years 2 months	−	−	+	−	−	−	−	Eleven years' duration.
699	M.	26	6.3	2 years 8 months	−	−	−	−	−	−	−	Secondary syphilis.
723	M.	21	21.9	2 years 6 months	−	−	−	−	−	−	−	Secondary syphilis.
778	F	24	7.8	2 years 3 months	−	−	−	−	−	−	−	Jaundice previously.
859	F.	54	9.0	2 years 2 months	+	±	+	−	−	±	+	Syphilitic cirrhosis of liver.
905	F.	24	16.5	2 years	−	−	−	−	−	−	−	Late secondary syphilis.
911	M.	23	13.2	2 years	−	−	+	−	−	±		Secondary syphilis.
926	F.	17	11.65	2 years	−	−	−	−	−	−	−	Congenital syphilis.
1024	M.	24	6.0	1 year 9 months	−	−	−	−	−	−	−	Arsenical dermatitis after seventh injectio
1049	M.	26	12.9	1 year 8 months	−	−	−	−	−	−	−	Old-standing syphilis.
1089	F.	28	13.5	1 year 7 months	−	−	+	−	−	−		Old standing syphilis.
1148	M.	40	7.8	1 year 5 months	−	−	−	−	−	−	−	Erythema after ninth injection.
1171	F.	25	1.2	1 year 4 months	−	−	−	−	−	−	−	Slight erythema after second injection.
1185	F.	51	8.7	1 year 3 months	−	−	−	−	−	−	−	Old-standing syphilis.
1189	M.	21	12.3	1 year 3 months	−	−	−	−	−	−	−	Secondary syphilis.
1209	F.	30	3.6	1 year 2 months	−	−	−	+	−	−	−	Three years old syphilis.
1219	M.	46	6.15	1 year 2 months	−	−	−	−	−	−	−	Old-standing syphilis.
1232	M.	37	8.7	1 year	−	−	−	−	−	−	−	Tabes.
1236	M.	20	16.05	1 year						−		Secondary syphilis.
1239	F.	28	8.7	1 year	−	−	−	−	−	−	−	Secondary syphilis.
1251	M.	45	7.8	1 year	−	−	+	−		−		Jaundice 6 months before tests.
1284	F.	38	6.9	1 year	−	−	−	−	−	−	−	Old-standing syphilis.
1299	M.	53	12.9	11 months	−	−	−	−	−	−	−	Primary syphilis.
1316	M.	29	8.7	10 months	+	±	+	−		±	±	Slight jaundice.
1330	M.	26	11.1	10 months	−	−	+	−	−	−	−	Secondary syphilis.
1353	F.	55	0.45	8 months	−	−	−	−	−	−	−	Tertiary syphilis.
1391	M.	42	1.5	7 months	−	−	−	−	−	−	−	Slight dermatitis after second injection
1396	M.	24	7.05	6 months	−	−	+	−	−	−	−	Secondary syphilis.
1398	F.	30	7.8	6 months	−	−	−	−	−	−	−	Secondary syphilis.
1401	F.	42	6.6	6 months	−	−	−	−	−	−	−	Secondary syphilis.
1408	F.	13	3.85	6 months	−	−	−	−	−	−	−	Congenital syphilis.
1417	F.	24	8.4	6 months	−	−	−	−	−	−	−	
1413	F.	23	6.0	6 months	−	−	−	−	−	−	−	Secondary syphilis.
1414	F.	31	7.2	6 months	−	−	+	−	−	−	−	Secondary syphilis.
1415	F.	23	7.5	6 months	−	−	+	−	−	−	−	Late secondary syphilis.
1418	M.	29	6.3	5 months	−	−	+	−	−	−	−	Syphilis of 4 years' standing.
1420	F.	22	7.8	5 months	−	−	−	−	−	−	−	Late secondary syphilis.
1430	F.	32	5.85	5 months	+	+	+	−	−	−	±	Pregnant. No jaundice.
1434	M.	35	5.7	4 months	−	−	−	−	−	−	−	Secondary syphilis.
1435	F.	20	8.4	4 months	−	−	−	−	−	−	−	Secondary syphilis.
1454	F	34	5.4	4 months	−	−	+	−	−	−	−	Tertiary syphilis.
1455	F.	34	5.85	4 months	−	−	−	−	−	−	−	Secondary syphilis.
1456	M.	23	4.5	3 months	−	−	−	−	−	−	−	Primary syphilis.
1457	M.	43	6.0	3 months	−	−	−	−	−	−	−	Tertiary syphilis.
1459	F.	22	6.0	3 months	+	±	+	−	−	−		Arsenical dermatitis.
1478	F.	18	5.45	3 months	−	+	+	+	+	+	+	No jaundice. Congenital syphilis.
1479	F.	28	4.75	3 months	−	−	−	−	−	−	−	Secondary syphilis.
1485	M.	49	0.6	2 months	−	−	−	−	−	−	−	General paralysis of the insane.
1487	M.	53	6.95	2 months	−	−	−	−	−	−	−	Old-standing syphilis.
1490	M.	34	5.25	1 month	−	−	−	−	−	−	−	Tabes. Jaundice 6 months later.
1494	F.	32	4.8	2 months	−	−	−	−	−	−	−	Secondary syphilis.
1495	M.	41	1.05	1 month 2 weeks	−	−	−	−	−	−	−	Tertiary syphilis.
1497	M.	53	1.12	14 days	−	−	+	−	−	−	−	Old-standing syphilis.
1498	M.	42	0.6	14 days	−	−	−	−	−	−	−	Old-standing syphilis.
1508	M.	54	None	——	+	+	+	−	−	−	−	Old-standing syphilis.

Key to Tests Employed.—E.A.=Ehrlich's aldehyde; U.=urobilin; H.=Hay; I.=iodine; Gm.=Gmelin; F.=Fouchet; L.=lipase. +, Positive; −, negative; ±, doubtful.

when positive, demonstrates the presence of a pathological amount of urobilinogen.

Schlesinger's test for urobilin: 20 c.cm. of urine is acidulated with acetic acid and then the urobilin is extracted by inverting with 5 c.cm. of amyl alcohol. The amyl alcohol layer is pipetted off and a few drops of a 10 per cent. alcoholic solution of zinc chloride are added to it. If a green fluorescence develops the test is positive; in addition the characteristic spectrum can be observed. A positive reaction demonstrates an excess of urobilin.

For the detection of bile pigments and salts the familiar—but unreliable as regards our special purpose—Gmelin's, Hay's, and iodine tests were employed.

Tests for Bile Pigment in the Blood.

To demonstrate the presence of these substances we have employed Fouchet's test. This reaction is extremely delicate, but nevertheless very simple to perform. To three drops of serum three drops of the following solution are added: 5 grams trichloracetic acid, 20 c.cm. H_2O, 2 c.cm. $FeCl_3$ solution (10 per cent.). A white precipitate appears at once and if bile is present the precipitate so formed becomes greenish-blue, reaching its maximum degree in twenty minutes. It is claimed by the originator of this test that it is capable of giving a positive result in so high a dilution as 1 in 60,000. Our observations have confirmed its extreme delicacy and reliability.

Blood Lipase Estimation.

We employed the method of Lowenhart. Into four test tubes 1 c.cm. of serum is placed, together with 0.3 c.cm. of toluene to prevent decomposition; 3 c.cm. of water are then added to each tube, making the total volume 4 c.cm. To two of the tubes 0.26 c.cm. of ethyl butyrate is added, and all four tubes are incubated for eighteen to twenty-four hours in an incubator at 37° C. At the end of this time the tubes are removed, and a drop of azolitmin solution is added to each. The tubes containing serum alone are alkaline, and are titrated with N/10 acid. The other tubes, in which the lipase will have produced butyric acid, are acid in reaction, and are consequently titrated with N/10 alkali. The amount of lipolytic action is the sum of the mean amount of acid and alkali used. Normally, this is between 0.2 and 0.3 c.cm.

To be of value as evidence, any series of tests must satisfy two criteria: they must singly or in combination be capable of returning positive results when the defect they claim to demonstrate is present; at the same time they must be of such a nature that they do not give positive evidence where normal conditions exist.

Hay's, the iodine, and Gmelin's tests failed to satisfy the standard of accuracy aimed at. On the other hand, we believe that Ehrlich's aldehyde test, Schlesinger's test, Fouchet's test, and the lipase test are trustworthy, as shown by the following investigations undertaken to test their reliability.

Negative controls were made on a series of sixteen students, and also on sixteen patients who had been admitted to hospital for conditions which did not involve the liver, and in whom, therefore, the liver functions might be assumed to be normal. In every case the tests as applied to the urine and blood gave negative results. This series of 32 cases indicates that the tests are so far reliable in that they do not give positive results where the liver is functioning normally.

The group of positive controls demands fuller consideration; details are given below.

CASE I.—C. A., female, aged 50 years, under the care of Dr. Essex Wynter. On admission the patient was jaundiced and presented a palpable mass in the left hypochondrium. All tests strongly positive. *Post-mortem* examination confirmed the diagnosis of a carcinoma of the gall bladder.

CASE II.—Mrs. S., aged 60 years, under the care of Dr. Wynter. On admission slight jaundice, with enlargement of the liver. A diagnosis of cirrhosis of the liver was made and verified *post mortem*. Here all the reactions were positive.

CASE III.—F. B. (under the care of Dr. Izod Bennett). The patient was a heavy drinker and presented the signs of alcoholic cirrhosis with enlarged liver. All reactions positive, except Gmelin and iodine tests. Lipase 0.6.

CASE IV.—H. R., aged 29 (under Dr. Cockayne). Enlarged liver; no jaundice. All reactions positive except Gmelin's and iodine tests. Lipase 0.5. Diagnosis, early cirrhosis.

CASE V.—H. N., aged 22 (under Dr. Cockayne). Jaundice started when 15 and has continued. No symptoms. Liver enlarged. Fragility of corpuscles increased. Clinical diagnosis, Hanot's cirrhosis. All reactions positive. Lipase 0.7.

CASE VI.—H. B., male, aged 8 (under Dr. Bennett). Three weeks before admission this child had acute catarrhal jaundice, but jaundice had practically disappeared when tests made; a slightly enlarged liver could be detected. All reactions positive. Lipase 0.5.

CASE VII.—E. H., female, aged 65 (under Mr. Sampson Handley). Jaundiced when admitted and distended gall bladder. At this stage all reactions were positive. After six weeks the jaundice and gall bladder distension had disappeared. All reactions were again positive at this stage except the iodine and Gmelin tests. Lipase 0.4.

CASE VIII.—Male, aged 14 (under Dr. Bennett). Patient had severe indigestion and "felt ill." All reactions positive except the iodine and Gmelin's reactions. A week later the patient developed acute catarrhal jaundice. Lipase 0.5.

These eight positive controls are summarized briefly in Table II.

TABLE II.—*Positive Controls.*

Case No.	Summary.	Blood.		Urine.				
		Fouchet.	Lipase.	Ehrlich Aldehyde.	Urobilin.	Iodine.	Hay.	Gmelin.
1	Carcinoma of gall bladder; jaundice	+	0.6	+	+	+	+	+
2	Cirrhosis; slight jaundice	+	0.5	+	+	+	+	+
3	Fatty infiltration; early cirrhosis (?); no jaundice	+	0.6	+	+	−	+	−
4	Early cirrhosis; no jaundice	+	0.5	+	+	−	+	−
5	Hanot's cirrhosis	+	0.7	+	+	+	+	+
6	Acute catarrhal jaundice	+	0.5	+	+	−	+	−
7	Biliary obstruction; jaundice	+	0.4	+	+	+	+	+
8	Acute catarrhal jaundice	+	0.5	+	+	−	+	−

We may now proceed to the examination of the series of 57 cases of syphilis where salvarsan had been administered and where the liver functions were investigated by the methods already detailed. Table I summarizes the type of case, the amount of arsenical compound administered, the interval after commencing treatment when the liver functions were investigated, and the results obtained from the investigation. Four different groups may be identified: those where dermatitis occurred; those where jaundice developed; those where chemical evidence of liver defect was shown by the tests (without clinical manifestations); and those where the liver functions appeared to be normal. The last group, as will be seen, includes the majority of cases.

Arsenical Dermatitis.

In this group are included five cases—1024, 1148, 1171, 1391, and 1459. Several observations may be made in respect of this group.

No. 1024 developed severe dermatitis after the seventh injection. The Wassermann reaction had become negative after the fourth injection, was again found negative, but became positive one year after the commencement of treatment and has remained positive up to the present date in spite of most vigorous treatment. One year and nine months after beginning treatment all the liver tests were negative. This patient made a complete recovery from his cutaneous disturbance.

No. 1148 developed dermatitis of moderate degree after the ninth injection, from which he completely recovered. The Wassermann reaction became negative after the fifth injection and remained negative for six months; it then became positive and has remained positive in spite of continued mercurial injections carried on for some months. In this case the liver functions were investigated one year and five months after treatment began and were all negative.

No. 1171—a female, aged 25 years, with congenital syphilis—received two injections of novarsenobenzol. She then developed an erythema. Treatment was continued with mercury. Here also the Wassermann reaction at first became negative but relapsed later to a positive phase. The liver functions were investigated one year and four months after the first arsenical injection and were then completely negative.

No. 1391 developed dermatitis after the second injection; there was complete recovery from this. The Wassermann reaction became negative seven months later. Seven months after commencement of treatment all reactions for liver function were negative. The subsequent history of this patient is not known.

No. 1459 developed severe dermatitis after the seventh injection of novarsenobenzol. She absented herself from the hospital for eighteen months. On returning the Wassermann reaction was found to be negative. In this case the liver function was investigated three months after the beginning of treatment and gave positive results.

These five cases present certain interesting features. It will be seen that in three out of the five the Wassermann reaction became ultimately positive—an observation contradicting the general statement that where dermatitis occurs a continued negative Wassermann reaction is the rule. In only one case was evidence of disturbed liver function obtained, and it is noteworthy that in this case the investigations were made at the shortest interval after the administration of the arsenic. It would seem, however, that even if a disturbance of the liver is associated with dermatitis, such a disturbance is of a temporary nature and is followed by complete recovery of function.

It will be noted that in these cases the total amount of arsenical compound (novarsenobenzol) varied considerably. The cases in which severe dermatitis developed (1024 and 1459) each received 6 grams. On the other hand, dermatitis of moderate severity followed doses of 7.8 and 1.5 grams (1148 and 1391). It would therefore appear that the degree of dermatitis does not entirely depend upon the amount of the drug administered; indeed, the dosage in these cases is less than that given to the average patient in the clinic, where the drug is readily tolerated. The occurrence of dermatitis in two sisters treated at different times indicates that some individual idiosyncrasy predisposes to this form of eruption.

Jaundice.

We have had the opportunity of testing the liver functions in five instances where jaundice followed the administration of novarsenobenzol. The tests were carried out at varying periods after the jaundice had manifested itself. The actual details may be summarized as follows:

No. 778, a female, aged 24 years, received 7.8 grams in ten injections with subsequent mercurial treatment. Twelve months after beginning treatment the patient developed a mild type of jaundice from which she made complete recovery. Three months later the liver functions were tested and were all completely negative. In this case cure of the syphilitic infection would appear to have been effected, for the Wassermann reaction was negative two years and three months after first coming under observation.

No. 1209, a female, aged 30 years, received 3.6 grams of novarsenobenzol in six weekly injections. Jaundice developed five months after the first injection. All the liver tests, except Hay's, were negative eight months later. The patient was probably cured, for the Wassermann reaction has remained negative, and a healthy child was born at the end of treatment.

No. 1251, a male, aged 45, suffering from tabes, received 7.8 grams of novarsenobenzol in ten weekly injections. He developed jaundice six months after the last injection. Here also all the liver tests were negative one year later—with the exception of Hay's test.

No. 1316, a male, aged 28 years, received 8.7 grams in ten weekly injections. Slight jaundice developed eight months after the first injection. In this case the liver tests were investigated while jaundice was still present and gave positive results (see Table I). It may be assumed that the syphilitic infection was cured in view of a series of negative Wassermann reactions obtained.

No. 1490, a male, aged 34 years, with tabes and a Charcot joint of the right ankle, received 5.85 grams of novarsenobenzol. He developed jaundice six months after the first injection. Here the liver tests were carried out after the third injection—that is, before the jaundice appeared—and were then completely negative. At this time, therefore, the liver functions were apparently normal. A complete recovery was made from the jaundice and an improvement also occurred in the tabes.

Jaundice is the most obvious and therefore the most frequently observed evidence of disorder of the liver following the administration of salvarsan compound. But apart from this very obvious indication of a derangement of the hepatic function, it is possible for a disturbance to occur

without jaundice. Such a defect can only be determined by special tests—for example, those we have already described in detail. While the incidence of jaundice may be used to indicate the degree of hepatic derangement from the arsenical substances, we believe better evidence can be obtained by employing special chemical tests for liver efficiency. All the tests used, as has been pointed out, were submitted to careful preliminary investigations, and these controls showed that Ehrlich's aldehyde, the urobilin, Fouchet's, and the lipase content tests could be relied upon; therefore deductions may be based upon the results obtained from these tests.

Conclusions.

If the series of cases investigated be now examined, it will be seen that out of a total of 56* cases, where arsenical preparations had been given, in 52 the chemical reactions indicated that the liver tissues at the time the tests were made were functioning normally. Since the derangement of liver function, if any, may arise during the administration of salvarsan, or at varying periods afterwards, it is of importance that any series of tests be made at different times. This has been done, and it will be noted that the range extends from four years and eight months through gradually shortening intervals down to a period when the tests were made while the patient was actually under arsenical treatment. These investigations go to show that the salvarsan preparation used, given in the doses indicated, does not cause either immediate or late damage to hepatic tissue except in a small proportion of cases. It should not be inferred that the proportion of jaundice met with in the clinic is 5 out of 56. Examples of jaundice are rare, and we were fortunate in obtaining these while the investigations were being carried out.

There is now an extensive literature on the subject of what may be called arsenical jaundice. So striking and suggestive a phenomenon as jaundice could not escape notice, but it is open to question whether the arsenical preparations used should be held entirely or generally responsible for the condition observed. Jaundice, and even acute yellow atrophy, were noted in connexion with syphilis long before arsenic was employed in the treatment of this disease. This is very fully dealt with in the admirable report of the Salvarsan Committee of the Medical Research Council on the toxic effects following the arsenobenzol preparations. There will be found among other records that of Lasch (1894), who noted 49 cases of jaundice in early syphilis, including one where acute yellow atrophy supervened; that of Wickham Legge of 100 cases of acute yellow atrophy, 8 of which were known to be syphilitic; that of Parkes Weber (1909) recording acute yellow atrophy in a case of recent syphilis; and others similar. There is thus abundant evidence that every degree of jaundice, and even acute yellow atrophy, may occur in syphilis as an accident of this disease, and therefore may be in no way connected with the use of an arsenical preparation.

In view of these facts many hold that the jaundice observed in syphilis, whether following salvarsan administrations or otherwise, should be attributed to a special effect of syphilis on the liver. There are, however, two facts of general acceptance which appear to challenge the complete acceptance of such a hypothesis. The first is the well known observation that the administration of arsenic for various conditions in individuals free from any syphilitic taint may be followed by jaundice; the second is concerned with the occurrence of groups of cases of jaundice or acute yellow atrophy in seeming epidemic form among patients being treated for syphilis with arsenical compounds. In the latter case the suggestion has been made that some additional infection is present and that persons suffering from syphilis are especially liable to infection of this kind. But even allowing full value to these observations, it can nevertheless be maintained from the evidence we have given that the arsenical substances may be safely employed in full doses without any considerable chance of causing temporary or permanent damage to the liver tissues. In this connexion four cases may be cited.

The first, No. 1508 in our series, a male aged 54, with old-standing syphilis, gave positive evidence of liver defect (see Table I), and yet in his case no salvarsan had been given. It is easy to see that had this man been treated with arsenic the condition discovered would improperly have been attributed to the drug used. Further, if salvarsan is as harmful to liver tissue as is sometimes alleged, it might be expected that where hepatic disease is already present the administration of the drug would produce some pronounced harmful effect. The following cases contradict such an assumption. No. 859, a female, aged 54, came to the hospital in 1918 with an enlarged and irregular liver diagnosed as syphilitic. She gave a history of several attacks of jaundice, there were scars about the region of the knees, and the Wassermann reaction was positive. This woman received 9 grams of novarsenobenzol in ten injections, following which the liver ceased to be palpable, and she made progressive improvement. Chemical investigations of the hepatic functions two years and two months after treatment had been commenced gave positive results (see Table I), although the patient's general condition still remained good. No. 1315 is an example of a similar kind. This patient, a female, aged 33 years, was admitted to a medical ward with the diagnosis of syphilis of the liver; the Wassermann reaction was positive and the liver was considerably enlarged. She received 5.85 grams of novarsenobenzol, and six months after the first injection the liver could no longer be felt. The third case is an example of jaundice during the early secondary period. The patient, a female aged 20 years, presented herself with marked jaundice and secondary syphilis. In spite of this she was given a first injection of 0.3 gram of novarsenobenzol, following which the temperature rose to 102°, the febrile period lasting some days. The hepatic region was tender and the liver was noted to extend downwards some three or four inches below the costal margin. Ten days later the liver appeared to have regained its normal size and a second injection of 0.3 gram of novarsenobenzol was given. This produced further fever, but of lesser degree; the liver again became enlarged and tender. A fortnight later a further injection of 0.3 gram was given. The jaundice had by now almost entirely disappeared, and from this time the patient made satisfactory progress.

While admitting that jaundice may result from the injection of any form of arsenic and apart from syphilis, and also that there is some evidence of the occurrence of epidemic jaundice among patients being treated for syphilis —which may point to some additional unknown factor—we are nevertheless of the opinion that, in the type of jaundice met with in the clinic where our observations have been made, the condition should rather be attributed to the disease than to the remedy used. Thus we have been unable to confirm the findings of others that a disturbance of liver function is common after arsensical administration; indeed, our observations lead us to take a contrary view. Further, it has been noted by us that in a number of cases where jaundice supervened during treatment, although the result of treatment might appear entirely satisfactory, after an interval the Wassermann reaction, which may have been, and usually was, negative, again became positive, indicating that sterilization had not been complete. It may reasonably be supposed that in these cases certain spirochaetes had escaped and had assumed a special activity in the liver substance, first producing jaundice and later the positive Wassermann reaction. It would appear certain that the incidence of jaundice among those suffering from syphilis is now higher than formerly. This may, however, be explained on the assumption that in consequence of the rapid destruction of the infecting parasites by the specific remedy those natural processes of protection which would normally be called into being are not elaborated, and thus any escaping micro-organisms find the tissues they invade in an unprotected state. This would account for the phenomenon noted —that is, jaundice. It is interesting to recall that in the early days of the use of "606" the remedy was blamed for the lesions of cranial nerves then not infrequently observed, but that later it was shown that these effects were the result of the disease, not of the remedy employed to treat it.

These investigations were undertaken with an entirely open mind. The object was to determine whether the

*It will be observed that in one case where liver functions were investigated (No. 1508) no arsenic was given.

methods of treatment employed were liable to cause injury to the hepatic tissue. This we believe not to be the case, and the evidence upon which this belief is based is given above.

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INSULIN IN ALCOHOLIC SOLUTION BY THE MOUTH.

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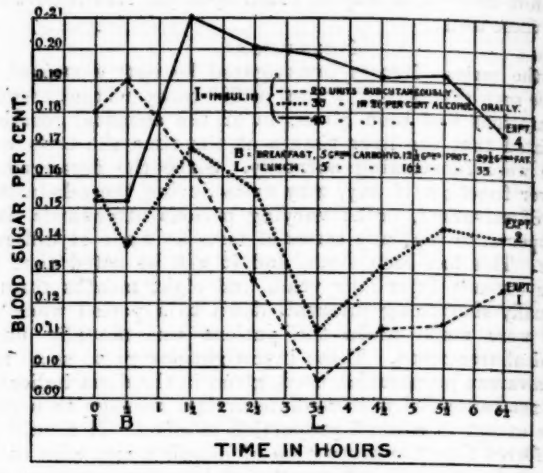
IN view of L. B. Winter's experiments on rabbits,[1] tests were made on a "pedigree" patient to see if it was a practicable therapeutic measure to administer insulin in alcoholic solution by mouth to man. Winter used very large doses of insulin. The present results in no way contradict Winter's findings—in fact, one experiment definitely supports his work; but they suggest that oral administration in alcohol would be so uncertain and so expensive as to be of little or no therapeutic value in diabetes mellitus in man.

The patient selected was a woman of 31 who has been treated with insulin and rigid dieting since April, 1923. Since September 26th her daily food intake has been 20 grams carbohydrate, 60 grams protein, and 120 grams fat, the carbohydrate being restricted to green vegetables. This amounted to 28 calories per kilo of body weight. With this diet she has taken 20 units insulin each morning and 15 units each evening.

The analyses are given in the table, and the single positive finding, one of the three negative experiments, and the control test with subcutaneous insulin in the chart. The same batch of insulin—namely, A.B. 239—was used throughout. For oral administration the insulin was removed from the phial by a sterilized syringe in the ordinary way and mixed with the requisite amount of alcohol and distilled water, the vessel being finally washed out with more of the diluted alcohol, which was also swallowed.

Having shown in Experiment 1 that the particular batch of insulin (A.B. 239) was potent when given subcutaneously, and that the dose of 20 units was causing the usual fall in blood sugar for this particular patient, 30 units were given by mouth on an empty stomach in 17½ c.cm. 20 per cent. alcohol (1½ c.cm. insulin solution, *plus* 6 c.cm. 25 per cent. alcohol, *plus* 10 c.cm. 20 per cent. alcohol). The result was decidedly hopeful (Experiment 2). Next day it was shown that 17½ c.cm. of 20 per cent. alcohol alone were without effect (Experiment 3), there being the typical diabetic



rise in blood sugar lasting over three hours even after so small a meal as 5 grams carbohydrate, 12½ grams protein, and 29½ grams fat. Three days later 40 units in 20 c.cm. 20 per cent. alcohol were given by mouth on an empty stomach (Experiment 4) without any apparent effect whatever. It was thought that the alcoholic solution had gone rapidly through the pylorus. In the next experiment, therefore, the 40 units were given after food—five minutes after a starch-free bran biscuit and half an ounce of butter; again with negative result (Experiment 5). Lastly, the effect of increasing the strength of the alcohol was tried (Experiment 6); 40 units in 20 c.cm. 40 per cent. alcohol were given, again without effect on the blood sugar curve (after breakfast). To make sure again that the insulin used was potent, 20 units were given subcutaneously on the same day immediately before lunch, with the usual fall in blood sugar.

From these tests it will be seen that, with one exception (Experiment 2), a dose of insulin by mouth double that required subcutaneously is valueless. Even if it were possible to supply insulin in alcoholic solution at

* Working on diabetes with a grant from the Medical Research Council.

	Experiment 1. Nov. 7, 1923.	Experiment 2. Nov. 8, 1923.	Experiment 3. Nov. 9, 1923.	Experiment 4. Nov. 12, 1923	Experiment 5. Nov. 16, 1923.	Experiment 6. Nov. 22, 1923.
Fasting blood sugar before insulin ...	0.180	0.155	0.145	0.153	0.212	0.190
Dose of insulin units	20, subcutaneously.	30, orally, taken fasting	Nil. (17½ c.cm. alcohol taken fasting)	40, orally, taken fasting	40, orally, after food	40, orally, in 40 per cent. alcohol, taken fasting
Blood sugar 1/2 hour after insulin ...	0.190	0.139	0.143	0.152	0.220	0.188
Breakfast (1/2 hour after insulin) consisting of 5 grams carbohydrate, 12½ grams protein, and 29½ gram fat ...						
Blood sugar 1½ hours after insulin ...	0.161	0.169	0.177	0.210	0.240	0.203
Blood sugar 2½ hours after insulin ...	0.128	0.156	0.193	0.201	0.223	0.218
Blood sugar 3½ hours after insulin ...	0.096	0.111	0.163	0.198	0.199	0.185
Lunch (3½ hours after insulin) consisting of 5 grams carbohydrate, 16½ grams protein, and 33 grams fat			15 units insulin subcutaneously		15 units insulin subcutaneously	20 units insulin subcutaneously
Blood sugar 4½ hours after insulin ...	0.112	0.132	—	0.191	—	0.193
Blood sugar 5½ hours after insulin ...	0.114	0.144	—	0.192	—	0.156
Blood sugar 6½ hours after insulin ...	0.125	0.141	—	0.174	—	0.102
Glycosuria, after the meals	Nil	Nil	Trace	Trace	Marked	Marked
Ketonuria, after the meals	Slight trace	Trace	Trace	Marked	Trace	Trace

Remarks.—In Experiment 1 there was the usual lowering of blood sugar. Experiment 2 showed definite but not such marked lowering of blood sugar. In Experiment 3 the blood sugar rose in the ordinary way. In Experiment 4 oral insulin had no effect; an evening dose of 20 units insulin was ordered instead of 15 units. In Experiment 5 oral insulin after food had no effect. In Experiment 6 oral insulin in 40 per cent. alcohol had no effect; subcutaneous insulin produced the usual lowering.

half its present price it would still be more expensive to give it orally. But to my mind much more serious than expense is the uncertainty of the oral method of administration. The very fact that a single positive result was obtained shows the possible danger of the method. We have no control over the pyloric sphincter. Also it is conceivable that there might be danger for those with achlorhydria (and it is to be remembered that 4 per cent. of healthy individuals are estimated to have achlorhydria) in that pepsin would not be activated, and in that an oral dose, if calculated from a series of experiments on other patients as being a certain multiple of the subcutaneous dose, might be an overdose for the achlorhydric. Moreover, if the insulin were given with food it is possible that variations in the articles of diet (in spite of keeping the intake of carbohydrate, protein, and fat constant) might influence the proportion of insulin absorbed or destroyed by pepsin.

The experiments are admittedly few in number and confined to one patient. This patient is an expert at diet calculations, however, and has submitted to a large number of blood sugar curves for previous experimental work. She has for several weeks given herself 35 units of insulin daily, and her fasting blood sugar, tested frequently, has remained steady within narrow limits. She, of course, stayed in the laboratory for these special experiments, eating her food off the laboratory bench. The results are recorded in the hope that other workers who have done similar experiments will publish their findings, and so prevent the raising of false hopes in the minds of those suffering from diabetes mellitus.

REFERENCE.
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A CASE OF MALARIA ARISING IN THIS COUNTRY.

BY

NEVILLE M. GOODMAN, B.A., M.R.C.S., L.R.C.P.

ALTHOUGH nearly five hundred cases of locally contracted malaria have been discovered in England since 1917, the vast majority of them can be traced to infection from cases returned from abroad. Indeed, it is probable that malaria is no longer endemic anywhere in England save in the isles of Sheppey and Grain on the south bank of the Thames estuary. The chief interest of the following case is that it suggests the possibility of another endemic focus in the Essex marshes on the opposite bank.

K., a girl aged 12, was admitted to the London Hospital on September 10th, 1923, with the following history:

A fortnight previously she had returned to her home in the East End from a Girl Guides Camp at Pitsea, Essex. Ten days later (that is, five days before admission) she had had a "shivering attack" followed by headache and "stiff neck"; the attack was repeated two days later. She felt quite well and said there was nothing wrong with her. Her bowels had been constipated since the onset and she had vomited once after the first attack. She had had no previous illness.

Her father, while at Gaza in September, 1917, was ill for three days with "sandfly fever"; he was cured by pills and did not leave the battery lines. In September, 1918, he had a similar attack in France; again he was cured by opium and quinine pills without going into hospital. He has had no attacks since and has been in perfect health. The mother is healthy and has had no shivering attacks; one other child, aged 9 years, is healthy.

The patient was a pale, intelligent child in no pain or distress. Temperature 105°, pulse 140, respirations 30. The tongue was furred; the heart and lungs were clear; spleen enlarged 2½ finger-breadths below the costal margin, uniform and rather hard.

First Day.—Rigor at 4 p.m.—four stages: (1) coldness of the feet spreading to the body; (2) trembling of shoulders and legs; (3) short sleep; (4) awoke feeling hot and sweating.

Second Day.—Rigor 5.30 p.m.

Third Day.—Rigor 2 p.m.; parasites (benign tertian) found in the blood.

Treatment by quinine was started. There were no more rigors, and the temperature remained normal. On discharge ten days later the spleen was not palpable.

The length of time (five years) since the father's last attack—if, indeed, he ever had malaria—and the absence of the anopheles mosquito from the East End district in which the patient lived eliminate the father as the source of infection. No history can be obtained of any lodger, relative, or neighbour ever having suffered from malaria, and everything points to the child's infection having been acquired while in camp. The children slept there in three barns situated in a lonely spot in the marshes south of Pitsea. The nearest habitation, the farm to which the barns belonged, was about half a mile away and was itself some three miles from Pitsea village. Inquiries revealed no recent cases of malaria and no returned soldiers were living in the neighbourhood. The farmer stated that in his youth "everyone" on the marsh had "ague," and he himself had had two attacks, one as a boy and one as a young man, some thirty years ago. He gave a vivid description of a typical attack of malaria. On examination his blood showed no parasites.

As late as October 30th mosquitos were plentiful in the neighbourhood and three were caught inside the barns where the children slept; they proved to be *Culex pipiens*. Pitsea, however, is given as a locality for *Anopheles maculipennis* by the authorities of the British Museum (Natural History).

I am indebted to Dr. Robert Hutchison for permission to publish this case.

LITERATURE.
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Reports to the Local Government Board, New Series, Nos. 119 and 123.
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Map showing distribution of *Anopheles maculipennis*. British Museum (Nat. Hist.), 1918.

SPONTANEOUS RUPTURE OF THE LOWER UTERINE SEGMENT.

BY

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SPONTANEOUS rupture of the lower uterine segment must be a very rare occurrence, and perhaps on this account the notes of the following case may be of interest.

I was asked to see a patient, aged 30 years, at 5.45 p.m., on account of abdominal pains which had commenced an hour earlier. She was then in the thirty-sixth or thirty-seventh week of her first pregnancy. The pains had the character of first-stage labour pains. External examination showed the child to be lying in the left occipito-anterior position. No vaginal examination was made as at the routine examination two or three weeks before no abnormality had been discovered. At 6 p.m. the pains became much more severe and I commenced the administration of chloroform through Junker's inhaler. At 6.15 the patient, although under the influence of chloroform, made a violent expulsive effort and the child was born. The infant weighed only 5 lb. and its head was very soft. Immediately following the birth of the child a large haemorrhage occurred. The patient was turned on to her back and the fundus of the uterus grasped; this was found to be well contracted. A hand was then passed into the vagina, and a laceration was found which admitted the whole hand and which extended through the cervix and lower uterine segment into the left broad ligament. The placenta was rapidly removed from the cavity of the uterus and the cervix drawn down to the vulval orifice. Two volsellae were then placed side by side at right angles to the cervical axis so as to take a broad grip of the walls of the tear and the cervix was then allowed to ascend to its normal position. The volsellae thus made a partial torsion of the line of laceration and controlled the bleeding. There was no damage to the vaginal walls or to the perineum. The usual methods to combat the shock were then adopted. Dr. Thomas Wilson saw the patient in consultation at 8.30 p.m., and it was decided to leave the volsellae *in situ* for forty-eight hours, and unless the haemorrhage recurred to carry out no further surgical procedure. The tear healed soundly and the patient made an uninterrupted recovery, but a certain amount of tenderness has persisted low down in the left iliac fossa ever since.

Seven months later the patient found herself pregnant again. No complications arose during the pregnancy, but during the thirty-fifth week it was found that the foetus was lying in the left sacro-anterior position. As spontaneous version did not occur, at the commencement of the thirty-ninth week external version was done under a general anaesthetic. The resulting position was right occipito-anterior. The child was born two days later; it weighed 7½ lb. Except for a slight opening up of the cervical laceration the labour was without complications.

The cause of the extensive laceration at the first labour is obscure. No complications had arisen during the pregnancy, and as the urine had remained free from albumin it would appear that toxaemic causes need not be considered. The tear extended so far upwards that it was impossible to

determine whether it began in a rupture of the lower uterine segment and spread downwards or in a tear of the cervix and spread upwards. The small size of the baby and the precipitate second stage suggest that the tear must have been caused by insufficient dilatation of the lower part of the cervix and external os, and raise the suspicion that this part of the uterus at least may not have been of full adult development. The juvenile form of cervix so often seen in association with acute anteflexion or primary retroversion of small uteri is fairly common, and it may be that this patient had such a cervix. The lateral situation and longitudinal extension of the laceration appear to favour this explanation of its origin, and so does the fact that in the second labour a 7½ lb. child was born without reopening the old laceration. The menstrual history of the patient up to the first pregnancy also suggests that the uterus was not quite normal. Menstruation started at the age of 14 years, was quite regular every twenty-eight days, lasted four days, but only four pads were required at each period. The patient always had severe abdominal pain before the onset of each period and occasionally passed small clots. Since the birth of the first child pain has been practically absent and the loss has been much more profuse.

I am indebted to Dr. Thomas Wilson for much helpful advice, both in the care of the patient and in the preparation of this note.

British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, 1923.

SECTION OF ORTHOPAEDICS.

T. H. OPENSHAW, C.B., C.M.G., M.S., F.R.C.S., President.

DISCUSSION ON THE OPERATIVE TREATMENT OF OSTEO-ARTHRITIS.

OPENING PAPER

BY

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ARTHRITIS DEFORMANS is somewhat difficult of definition; it undoubtedly embraces cases due to a variety of causes. McCrae attempts to define it as a group of cases of arthritis which have as prominent features a tendency to chronicity and to the production of more or less permanent changes in the joints or structures about the joints, those forms of arthritis with a definite known etiology (for example, gonorrhoeal arthritis) being excluded. I would make this difference—that it is perhaps better from the practical point of view to retain those cases excluded in the latter part of this definition, if they are chronic and deforming. When considering cases of arthritis from the surgical point of view, one is bound to found one's views of treatment largely on the practical result that the arthritis has produced and not entirely upon the etiological factors. McCrae says it is important to remember that arthritis is always secondary to a process elsewhere; the joint condition is not primary. In this he has perhaps paid insufficient attention to the occurrence of arthritis in a deformed joint—for example, the frequent occurrence of arthritis in coxa vara and coxa plana, in genu valgum, and in joints which have been damaged by intra-articular fractures, or whose alignment has been interfered with by a fracture farther away from the joint.

It is difficult to determine how many diseases are really included under arthritis deformans. It is quite certain that "in all chronic joint changes the same cause may produce varied results and the same results may come from different causes." There appear to be many causative elements, of which we may class as the most important:

1. Infection of the joint with a micro-organism of low virulence.
2. Toxaemia, possibly from a bacterial poison, possibly from a chemical poison.
3. Trauma, including not only direct damage to the joint structures by injury, but also the reaction to an abnormal strain and an interference with the proper fit of the joint surfaces, due to old-standing injury or deformity.

The physiology of joints is not yet very well understood. The secretion of synovial fluid is still somewhat of a mystery; there are no glands for this secretion, and it is formed apparently by the cells lining the synovial membrane, presumably through some form of proliferation and mucoid change. It is believed that the cartilage covering the bone surfaces is in a constant state of cell growth towards the articular surface. The bone underlying it and around the margins of a joint we know to have potentialities of growth and alteration throughout life. The whole of the interior structures of a joint must thus be looked upon as possessing potentiality for growth, which shows itself in the reaction to any of the above-mentioned causes of arthritis.

Changes in the cartilage in the shape either of thickening or of erosion and ulceration, changes in the synovial membrane in the shape of proliferation or of fibrosis and thickening, and changes in the bone in the shape of overgrowth at the joint margins, may all occur in a chronic arthritis due to any of the many different causes. In addition there is a far greater potentiality for the formation of new tissue in joint structures than is commonly realized. We know that cartilage may not only thicken, but may also extend over osteophytes around the joint margin, that new masses of cartilage may develop in or under the synovial membrane, and that small portions of cartilage or synovial membrane flaked off and lying in the joint cavity may undergo growth into cartilaginous loose bodies, and bone may develop in their interior. We must discount the actual nature of the pathological changes in every case when we try to estimate the causation. It is quite clear that these many changes are of the nature of a reaction of the joint structures to an injury, or to a bacterial or chemical poison, and are none of them specifically due to any one of these causes.

The classification into clinical types—that is, into those mainly characterized by periarthritic changes, and others of the atrophic and hypertrophic types—is useful, but is not of any special service from the surgical point of view.

Operative treatment has a very definite place in the treatment of arthritis deformans, but in the main it concerns itself with the removal of mechanical causes and with the treatment of particular functional disabilities. Operative treatment must always take a secondary place to a careful medical investigation and treatment of any primary cause. The first steps in treatment should be:

1. The determination, as far as is possible, of the existence of any specific infection or toxaemia.
2. The determination of the existence of any mechanical cause.
3. The treatment of an infection or toxaemia, if it has been found to exist.
4. The treatment of the more acute periods of inflammation by rest.

The operative procedures which may be useful in arthritis deformans may be classified under the following heads:

1. Operations to correct pre-existing deformities—for example, osteotomy to secure abduction of the hip in coxa vara, osteotomy of the femur for genu valgum, genu varum, and genu recurvatum.
2. Operations to remove an intra-articular cause of the arthritis—for example, removal of a permanently displaced internal semilunar cartilage or of a cartilage which is constantly being displaced, and which by its mechanical effect is producing secondary arthritic changes in the knee-joint; removal of a loose body or of a foreign body from the

knee; or the removal of a ridge or irregularity left by a fracture.

3. Operations for an acute condition of arthritis—for example, by an incision of the joint, or by puncture of the joint and washing out of the cavity either with an antiseptic or with normal saline solution, or with ether.

4. Operations designed to improve the functional utility of the joint, or to enable the joint or limb to be used without pain, the pain being due to a mechanical cause and not to an actual inflammation. Operations coming under this heading will include (*a*) the removal of osteophytes, either because they are blocking the movement of the joint, or because their presence is producing pain on certain movements; (*b*) excision of the joint, or arthroplasty carried out with the intention of securing a functionally good mobile joint; (*c*) excision or arthrodesis, carried out with the intention of securing bony ankylosis of the joint in order to improve the functional use of the limb or to do away with pain occurring in a joint in which there is a small remaining range of movement; (*d*) operations carried out in order to alter the position of a fixed joint, so as to improve the functional utility of the limb.

1. *Operations to Correct Pre-existing Deformities.*

There is no doubt that the abnormal strain upon the joint in coxa vara, genu valgum, etc., is an important cause in the production of a localized arthritis deformans of the affected joint. It is in a sense too late to correct the deformity if the osteo-arthritis has arisen, nevertheless this procedure is often necessary, either simply in order to alter the strain upon the joint and so diminish the progress of the osteo-arthritic changes, or because an appliance is necessary which cannot be fitted in an adequate manner to the deformed joint. The operations required are the standard osteotomies of surgery, such as transtrochanteric osteotomy and Macewen's osteotomy of the femur. They require no further mention.

2. *Operation for the Removal of a Semilunar Cartilage.*

Removal of a semilunar cartilage or of a loose body, which is producing osteo-arthritic changes, would seem to be a common-sense procedure, nevertheless such removal of a mechanical cause is too often neglected. I have removed a semilunar cartilage from an osteo-arthritic knee in which the cartilage had been damaged over twenty years before and had been displaced at frequent intervals over this period of time. The operation stopped the progress of the osteo-arthritic changes and improved the function of the knee very greatly indeed.

3. *Operations for an Acute Condition of Arthritis.*

There is much doubt about the value of such procedures as incision and washing out of the joint. My personal experience of them is not great, and I have little faith in the utility of washing out a joint, except in occasional cases in which a chronic effusion of considerable size fails to diminish as the result of complete rest by splinting. The efficacy of this procedure must necessarily depend largely upon the nature of the cause. It can hardly be expected to be of any value in cases other than those of definite infection of the joint.

4. *Operations Designed to Improve the Functional Utility of the Joint.*

(*a*) *Removal of Osteophytes.*—This operation may be useful in any of the joints of the body, when an osteophyte has been ascertained to be blocking movement or producing pain. When carried out for such a purpose it is very essential to define exactly the position of the osteophyte; this is best done by means of stereoscopic *x*-ray photographs. The removal should then be carried out with as little exposure of the joint as possible. In some cases a wide exposure of the joint and a general removal of all osteophytes is a useful operation. It is most often applicable to the hip- and knee-joints. In the hip-joint I prefer to carry out such a proceeding through a posterior (Kocher) incision, lifting the muscles off the great trochanter and opening the capsule above and behind. The head of the femur can then be completely dislocated posteriorly and rotated in different directions whilst it is trimmed up round all its margins. If the cartilage remaining on the surface of the head and lying in contact with the acetabulum is intact, the femur can then be replaced in its socket and the capsule and muscles sutured. The limb should be kept on a heavy weight extension (20 or 25 lb.) for a period of six weeks, and movement then commenced. It is better to deal only with the femoral surface, unless some evident large osteophyte on the acetabular margin requires removal for mechanical reasons. The cut bone on the femoral neck may be rubbed with a fairly hard wax. This operation is only suitable for subjects up to the age of 45. There is no doubt that this procedure in suitable cases improves the function of the joint for a considerable period and diminishes the pain that is often felt on forced abduction. It is not so severe an operation as might be thought, and it is particularly suitable for those cases of osteo-arthritis of the hip with a large deformed femoral head, seen in young or middle-aged patients, which have probably resulted from a coxa plana arising in early life.

In the knee-joint a similar operation for the general removal of osteophytes is, in my experience, rather less successful. The joint must be approached either by splitting the patella vertically or by a curved longitudinal incision on the inner side, as advocated by Fisher. In the latter case the patella is displaced right over to the outer side of the joint. The margins of the femoral facets and of the patella require trimming up; the tibia is best left alone, except for the removal of any osteophytes which are causing mechanical trouble. If the semilunar cartilages are damaged or ossified, they must be removed at the same time. If the joint surface is found to be much eroded, the result of the operation is not likely to be good. The posterior part of the joint cannot be explored very thoroughly through this incision unless the crucial ligaments are divided, an undesirable proceeding. Fortunately it is seldom that osteophytes in this position require removal. When such are present, they must be approached by separate incisions on the inner or outer side at the back of the knee. Again an extension should be kept on the knee for a period of six weeks before recommencing movement.

(*b*) *Arthroplasty and Excision.*—Operations designed to reconstruct the joint and leave a mobile and useful joint are decidedly unsuccessful in cases of rheumatoid arthritis. Our first care must be that we leave a joint which is functionally more useful than the deformed joint and at least as useful as an ankylosed joint would be. The second consideration is that the new joint must be free from pain. As a general rule an attempt to make a new joint involves an operation that is more severe than arthrodesis, and where an ankylosed joint would give at least as good use as a mobile joint the latter operation is to be preferred. In the shoulder-joint excision or arthroplasty has so far failed to give useful functional movement. This joint seldom calls for operative interference in arthritis deformans; when it does, it is on account of pain, and an ankylosis of the joint must be considered as the most satisfactory proceeding. Of all the joints the elbow gives the best results by arthroplasty; it is seldom, however, that arthritis deformans affects the function of the elbow to such an extent as to necessitate this operation. Practically, the operation is only indicated in cases in which the elbow is stiffened in a bad position—that is, where the range of movement does not include the right-angled position. Arthroplasty in which the olecranon is left and a flap of fascia inserted is preferable to the old-fashioned excision, which leaves a more mobile, but much weaker joint. In the wrist-joint arthroplasty is not called for. If the radio-ulnar joint has been affected and pronation and supination seriously interfered with, Gallie's operation for removal of a small section of the lower end of the shaft of the ulna is the simplest procedure.

Arthroplasty in the lower limb, more particularly in the hip and knee, has been a far less successful operation than it is in the elbow, the reason being that stability in these joints is essential, and it is therefore necessary to limit the amount of bone excised in order to avoid a flail joint.

Moreover, the fact that in standing and walking there is direct pressure through the excised joint must be an important factor in rendering post-operative stiffness, or even ankylosis, of the joint probable. I would not advocate arthroplasty of the hip-, knee-, or ankle-joint in any case of osteo-arthritis. In my opinion, in all these joints a better functional result is obtained by the operation of arthrodesis. Arthroplasty is essentially the operation for osteo-arthritis of the great toe-joint (hallux rigidus); the procedure of a limited excision of the head, trimming up and filing of the surface, and the insertion, where possible, of a flap of fascia, is so well known that it needs no description. It is important to bear in mind that this operation is not a trivial one and must be carefully performed, and that it should be followed up by after-treatment lasting for at least two months, the toe-joint and the transverse arch of the foot being supported by strapping.

(*c*) *Arthrodesis.*—This is the most generally useful of all operations for joints affected by arthritis deformans which remain chronically painful in spite of other treatment, and for those in which function is seriously interfered with by a progressive deformity. It is most often applied to the hip- and knee-joints. In the hip-joint it is commonly considered a very severe operation involving much shock. If the joint be immobilized in plaster-of-Paris at the time of the operation the shock involved is much less than is commonly believed, and there is no reason why the procedure should not be applied to people up to the age of 55 or 60, if their general condition is good. There are several methods of arthrodesing the joint. That which I personally prefer is to approach the joint by a Kocher's incision, turn the head right out of the acetabulum and trim it up, removing all cartilage and osteophytes until a spherical surface of bare bone is produced. A corresponding raw cup is then prepared in the acetabulum with mallet and gouges and finally cleaned up with a rotating burr of the shape and size of the femoral head. The head is then replaced in its socket, the wound sutured with drainage, and the limb fixed in plaster-of-Paris at about 35 degrees flexion and slight abduction. The patient must remain in bed in the plaster for six weeks. A short plaster is then applied in which the patient should walk for the next four months. In cases in which I have started to remove osteophytes from the head of the femur and found that the articular cartilage is eroded, I have completed an arthrodesis by the above method straight away.

In the knee-joint arthrodesis is suitable more particularly for unilateral cases in which the movement remains much limited and painful, especially if the knee has become flexed. In some cases such flexion deformity can be reduced by extension and splinting; in others, however, it will be found that the joint changes are such as to leave a mechanical blocking of extension. In these an exploration of the knee-joint must be carried out, and if the articular surfaces are much eroded an ankylosed joint will give the best functional result; a limited excision of the classical type without removing the entire synovial membrane is the best and simplest procedure. Much bone must not, however, be removed, as there is a far greater risk of non-union than exists in an excision carried out for tuberculosis in young subjects.

Arthrodesis of the shoulder is justifiable in occasional cases in which pain persists in spite of all other forms of treatment.

(*d*) *Operations to Alter the Position of a Fixed Joint.*—These require little comment. Those most often necessary are an osteotomy for a badly adducted hip, an osteotomy for a flexed knee, and the removal of a wedge from the posterior part of the carpus to correct a fixed, flexed wrist. In some of these, when the patient is under the anaesthetic it is found that a little mobility remains in the joint; it may then be questioned whether an arthrodesis should not be substituted for the other operation. In flexion of the knee, operations for division of the hamstring tendons, the attachments of the gastrocnemii and the posterior part of the capsule are sometimes required in order to straighten a knee in which sufficient movement remains to be functionally useful.

DISCUSSION.

I.—P. JENNER VERRALL, F.R.C.S.,

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I WISHED to open the discussion in order to explain that, as secretary of the Section, in order to obtain the maximum benefit from the limited time at our disposal, I had asked speakers to confine their remarks each to a comparatively limited portion of the field, with the exception of Mr. Elmslie, whom I asked to cover the whole ground as a lead to others, and whom I should like to congratulate on the lucid and compact manner in which he has done this.

By agreement, I shall confine my few remarks to the subject of the less drastic operative procedures which may be carried out for this disease.

Irrespective of the pathology, the treatment can be divided into two definite parts—that of the causative disease, and that of the local condition. The pendulum has swung from inefficient recognition and treatment of the former to efficient treatment of this and neglect of the latter. When once we are satisfied that the causative disease is adequately treated, the remainder of the problem is purely orthopaedic. It is, in fact, traumatic. Like any other piece of mechanism, a joint, if forced to work under unsound mechanical conditions, tends to become increasingly disorganized owing to abnormal stresses and inaccuracies of surface. The trauma may be one of three kinds: original external violence, causing localization of the disease in a certain joint from diminished resistance; due to malposition and consequent abnormal strain; or internal recurrent trauma from structural defects within the joint.

As growth and nutrition are dependent on function, provided that the supply of toxin be cut off and the joint surfaces not very severely damaged, if our skill were sufficient to reproduce by operative means a joint so perfectly shaped as to be mechanically sound, and ensure that that joint be exposed to no abnormal stress, the disease would cease to progress.

In the knee-joint the presence of loose bodies, ragged semilunar cartilages, lipomata arborescentia, and osteophytic outgrowths provides just that adverse weight in the balance which prevents natural function from exercising its restorative power, as these structures render the joint unsound, and also the nipping of loose structures between the joint surfaces and the continual impingement of osteophytes on the lateral expansions of the vasti give pain and limit free function.

I would plead, therefore, that as soon as the toxic element is checked, early operative measures should be considered, especially where the skiagram or some special clinical feature indicates the presence of the conditions mentioned above. Like others, in selected cases, I have had good results from extensive "spring cleanings" of joints through large incisions, but I feel that we should forestall the necessity of these by operating earlier.

It will be argued that patients will not readily submit to operative measures while their disease is in its early stages, and also that the age of those patients commonly afflicted with this disease makes surgeons loath to operate. Against this I would argue that the risk of sepsis in joint operations is now negligible; there is little shock in these less drastic operations and convalescence is rapid; and finally, that we are attempting to discover ideal methods of treatment, trusting that when we can advise those methods whole-heartedly, our patients, being but human, will be more inclined to be guided by us.

The methods I employ do not differ materially from those described by Mr. Elmslie. In the knee lateral incisions will suffice in the early stages and a split-patella operation is rarely needed, but should be employed without hesitation when required. Mr. Elmslie speaks of six weeks' extension as after-treatment, and this is certainly advisable after a drastic operation, but when an early operation is performed it is my practice to treat, say, the knee in exactly the same way as I should a simple removal of a semilunar cartilage, and to pay the same attention to restoration of muscle power as I should in that case.

One other point: Mr. Elmslie speaks of incision and lavage of joints as being suitable to acute conditions only, and has little faith in such treatment in chronic cases. I agree; but there is a certain type of arthritic joint which is definitely benefited by this. Chronic arthritis of the proliferative type with chronic effusion, where the causative disease is intestinal (typhoid, dysentery, or *Bacillus coli*), responds well to this treatment. I cannot explain this, but have found it true. At first I opened the joint and washed it out with saline, but after reading in 1920 of the employment by Rocher of Bordeaux of ether to wash out joints through a puncture with trocar and cannula, I employed ether lavage through an open incision. Cases other than intestinal were disappointing, but the intestinal cases were all improved. The treatment is empirical, and whether the effect is due to induced hyperaemia, sterilization, or some other factor, it is hard to say. I am inclined to believe that the free admission of air to the joint is of value. Be that as it may, I can confidently recommend this treatment, in this type of case.

II.—HARRY PLATT, M.D., M.S., F.R.C.S.,

Senior Surgeon, Ancoats Hospital, Manchester; Consulting Surgeon, Grangethorpe Hospital (Ministry of Pensions), and Ethel Hedley Hospital for Crippled Children.

In accordance with the suggestion of the officers of this Section my contribution will be limited to a consideration of the operative treatment of osteo-arthritis of the *hip-joint*. Although in the majority of cases this is a monarticular affection, it is not uncommon to find evidence of early arthritic changes on the so-called healthy side. It is important to examine the patient very carefully with this in mind, as the choice of the appropriate operative procedure and its scope will be influenced to some extent by the possible existence of a bilateral lesion. It should hardly be necessary at this date to dwell on the now well known fact that the term *morbus coxae senilis*, so often applied to the affection under consideration, is a misnomer. We may encounter the typical picture of osteo-arthritis of the hip at all periods of adult life—the arthritis deformans juvenilis, the common osteo-arthritis of middle age, and the classical osteo-arthritis of old people.

An increasing familiarity with the living pathology of this condition in its various phases, acquired as a result of a considerable number of operative exposures of the deformed joint, gives one a clear appreciation of the real mechanical significance of some of the outstanding pathological changes. Thus there is a tendency to regard the marginal osteophytic deposits as the essential cause of the limitation of mobility and pain. This conception, to my mind, is erroneous. In the florid arthritis deformans of the hip the dense infiltration of the capsule, which becomes shortened and adherent to the femoral neck, together with the expansion and mushrooming of the femoral head, constitute the main obstacles to free mobility. Later on, with the development of an adduction contracture, and the more advanced degenerative changes in the articular surfaces, the reason for the mechanical block is obvious. The severe pain is dependent on the friction and crowding together of the two eburnated bony surfaces from which every trace of cartilage has usually been lost at an early date. From such considerations it will be seen that the operation of simple *cheilotomy* is founded on an illogical basis. But the removal of the osteophytic rim of the acetabulum as part of a free excision of the infiltrated capsule is a conservative procedure of undoubted value in the early stages. I have done this on a few occasions where the amount of deformation of the joint did not seem to warrant the more radical operations of excision of the head of the femur, or arthrodesis. It is fair to recognize, however, that there is one type of case, admittedly rare, where simple exsection of the osteophytes alone is exceedingly effective. These are the hip-joints which show large isolated bony outgrowths of the stalactite variety, growing from the acetabular floor or from the margin of the femoral head. Such bizarre changes are atypical, and are not usually associated with advanced deformation of the femoral head or extensive loss of articular cartilage.

In actual surgical practice we are generally called upon to deal with osteo-arthritis of the hip in the matured stage in a patient who has passed through some years of ineffective treatment for so-called "sciatica," and who is becoming progressively crippled. The clinical picture varies considerably; many individuals look upon the limitation of mobility as a minor affair, but find the constant pain with its repeated severe exacerbations absolutely intolerable; in a smaller number (I am quoting my own experience) pain is a less conspicuous symptom, but the increasing stiffness is much resented. It is thus very necessary for the surgeon to appreciate the disability from the patient's own point of view.

Our collective experience of the late results of the major operative procedures employed for this condition has taught us that the majority of patients are well satisfied with a painless bony ankylosis of the hip. Thus as a fundamental consideration the operation of *arthrodesis* is to be regarded —in theory at least—as an ideal procedure. I feel, however, that there are certain objections to this operation in the case of older patients. In order to ensure adequate bony fusion of the femur to the acetabulum it is essential to remove in their entirety the layers of dense sclerosed bone which now represent the articular surfaces. This is accomplished without much difficulty after the femoral head has been fully dislocated. The operation, however, tends to be a lengthy one, and the duration of the anaesthesia is increased by some twenty minutes at least if a plaster-of-Paris spica be applied at its conclusion—a step which one feels is desirable, as Mr. Elmslie suggests. For these reasons arthrodesis, in my opinion, is applicable only for the younger or more robust patients. It is in those older patients for whom we consider arthrodesis a serious risk that the operation of *excision of the femoral head* finds a definite place. I have practised it now in some twenty cases with a clear appreciation of its limitations, but with the firm belief that in picked cases it is well worth while.

The details of the technique I follow have already been described in this JOURNAL (April 29th, 1922). The essential features are: (1) excision of the mushroomed femoral head; (2) abduction of the femur so as to bring the stump of the neck (previously rounded off) into the acetabulum; and (3) fixation of the great trochanter (which has been detached as part of the anatomical exposure of the joint) to the femoral shaft at a lower level, thus acquiring a position of mechanical advantage. The operation can be carried out rapidly, and I believe that it is much less provocative of shock than an efficiently performed arthrodesis. Its outstanding virtue is the relief of pain which follows; in addition the malposition of the joint is corrected, and a certain range of mobility is retained. In my earlier cases I was content with a relatively conservative removal of the femoral head, but now I advise and practise a much more generous resection. This is especially necessary where the opposite hip is the seat of a very early arthritic process.

Although as part of this discussion one has dealt with major operative procedures in some detail, it is desirable to emphasize the fact that, taking osteo-arthritis of the hip as a whole, it is only in a small proportion of cases that, after mature deliberation, we carry out such operations.

III.—D. McCRAE AITKEN, F.R.C.S.,

Surgeon, Ministry of Pensions Hospital, Shepherd's Bush, and Shropshire Orthopaedic Hospital.

MR. ELMSLIE, in opening this discussion, very properly laid emphasis on the septic or toxic factor in the production of the numerous varieties of osteo- and chondro-arthritis which can be quite fairly included in the vague term "arthritis deformans." Although Aphrodite may have risen complete and perfect from the sea foam, that is not the usual biological procedure; we expect to find an ovum at the beginning of life, and in the same way we may expect to find very small beginnings which are quite different in appearance from the fully formed picture of the disease found at an autopsy. Sir Arthur Keith, in his account of Hugh Owen Thomas,[1] points out that he started a new school of bio-pathology, as distinct from the Hunterian school of necro-pathology; he studied the gradual

growth of crippling conditions in the living and devoted his life to the prevention of the development of crippling diseases.

In pursuit of this idea, I maintain that we as orthopaedic surgeons discussing this large subject must look for the beginnings of the trouble, and, while we cannot omit the aid of the physician and the expert in the production of vaccines, our own particular *métier* is dealing with the traumatic element. My firm personal belief is that trauma is the actual cause of deformity in every case of arthritis deformans. The toxic or septic agent causes inflammation with its attendant hyperaemia and congestion in and about the joints. In 1863 Hilton published his lectures on *Rest and Pain*; at the same time Hugh Owen Thomas was devising splints to put joints at rest without necessarily having to put the patient to bed. The marrow of the whole matter is to be found in correlating the teachings of Hilton and of Thomas. The Liverpool school will keep the teaching of Thomas green for years to come. Is Hilton honoured in his own school as he should be?

Following Thomas's method of attacking the subject, I would divide the procedures of the surgeon into two groups —the first, bloodless methods; and the second, methods by open operation.

1. *Bloodless Procedures.*

I recognize four types of procedure, which I shall take in order of severity:

(*a*) Prevention of mechanical injury to pads of fat and to congested synovial membranes by suitable splint. One case suffices to illustrate this. We are all familiar with the patient who complains of pain in the middle of the front of the knee after walking, and especially of trouble in negotiating stairs. On examination it is found that full extension by the surgeon causes pain and that the patient will not voluntarily extend through the last few degrees, but the *x* rays show little or no osseous change. All the mechanical help he requires is a knee-cage adjusted to prevent full extension which nips the congested structures in the front of the joint. The patient then finds that he can walk with less pain or none at all, and in the meantime the physician gets a fair field for his therapeutic measures.

(*b*) Cases in which the *x* rays still show very little osseous change but there is a definite deformity, due largely to shortening of muscles, usually flexor muscles, the result of long retention of the joint in wrong position. Probably the source of infective trouble has been already dealt with by the physician, but the orthopaedic consideration of the case has been omitted. This type requires correction of the deformity under an anaesthetic, followed by strict fixation in the corrected position, until adaptive changes have occurred and the correction is thus established.

In both these types re-education of the weaker groups of muscles is an essential part of the treatment.

(*c*) Cases in which the *x* rays show hypertrophic changes round the margins of the joint, but the actual weight-bearing surfaces seem clearly defined. For example, at the hip-joint the patient complains of pain after walking almost more than when walking. On examination there is a limited range of movement free from pain; but an attempt to force the movement beyond this causes pain. In many of these cases the pain is caused by stretching adhesions which have formed about the joint and not by grinding of inflamed joint surfaces. If the surgeon is satisfied on this point and is also satisfied that the source of infection is cured or under control, then the adhesions may be broken down without fear of lighting up fresh inflammation, and this in many cases increases the range of movement and so relieves the pain, which is due to tension on adhesions.

(*d*) Cases in which obstructions within the joint are occasionally amenable to treatment by manipulation. For example, cases of osteo-arthritis of the knee with bony and cartilaginous masses within the joint so situated that the patient cannot bear weight on the knee can sometimes be relieved by a manipulative treatment to get the masses moved to some part of the knee in which they cause no trouble.

I have been privileged to see and assist Sir Robert Jones manipulate several such cases. Many of the cases have been very satisfactory to the patients and most surprising to me. I do not suggest this as a routine procedure, for it requires more judgement in the selection of cases than I feel I have yet acquired, and it requires some courage to face the situation if the procedure is not successful.

2. *Open Operations.*

These, I think, fall into the following categories:

(*a*) Operations involving removal of soft parts which have become thickened by repeated injury *plus* the congestion caused by toxic influences and have become mechanical obstructions to movement. Such operations are commonly performed at the knee, less often at the ankle, about the head of the radius, more rarely at the wrist-joint. The procedure is in every way comparable to removal of a crumpled semilunar cartilage at the knee.

(*b*) Operations for the removal of limited portions of bone or articular cartilage which are hypertrophied and causing obstruction and pain. These cases fall into two subdivisions:

(i) Those cases in which overhanging lipped edges of joint surfaces obstruct the free movement of tendons or aponeurosis, causing snapping of the joint with pain and considerable disability. A common example of this is found along the margin of the articular surfaces of the condyles where outgrowths of bone obstruct the free movement of the aponeurosis of the vastus muscle. Mr. Verrall removes these, leaving a raw surface of bone which he treats with wax. My procedure is, wherever possible, to leave the articular cartilage, but to cut away subjacent bone and then press down the cartilage so that the edge of the articular cartilage meets periosteum; thus I try to leave no bare or exposed bone within the joint. Of course, all masses of congested fat and synovia are removed.

(ii) The second class is where the outgrowth of bone and cartilage impinge on the opposite bone. The most common example of the type is to be found at the anterior lip of the articular surface of the tibia. In the skiagram [exhibited] the bone as well as the cartilage may be seen heaped up in a ridge or crest. On opening the joint the cartilage is seen to be red and hyperaemic and a similar hyperaemic line is found opposite it on the condyle. Behind this crest there is usually a pocket of hyperaemic soft parts and, perhaps, remnants of a semilunar cartilage. These should be removed as a matter of routine. But here again I cut away a wedge of bone under the redundant edge and depress it. The fact that the patient allows full extension of the knee immediately after the operation and gets up and walks with comfort eight or ten days later is to me a satisfactory proof that the operation clears away the cause of his trouble, and I think the avoidance of bare bone within the joint diminishes the risk of subsequent adhesions.

I understand others will deal more fully with the questions of arthroplasty and arthrodesis, so I may close with only one more remark. The treatment of the source of infection must not be omitted and should precede treatment by open operation, but may run concurrently with treatment by rest in splints.

REFERENCE.

[1] *Orthopaedic Surgery of Injuries.* Edited by Sir Robert Jones, vol. i, p. 1.

IV.—C. MAX PAGE, D.S.O., F.R.C.S.,

Surgeon to Out-patients, St. Thomas's Hospital.

I PROPOSE to limit my remarks to the practice and results of arthrodesis of the large joints of the lower extremity.

The operation of arthrodesis is certainly the most radical and final method of dealing with the condition under discussion. It cannot be regarded as ideal, in as far as the function of the joint is completely eliminated. Moreover, though the production of a complete ankylosis removes all pain in the joint affected, it exposes neighbouring joints to unusual strain and may be productive of secondary changes and pain in them.

One cannot but feel that in order to size up the relative value of the various operations for osteo-arthritis at present under trial we have need of the careful record of a series of cases over a prolonged period. I confess that I am sceptical as to the number of radical cures which can be looked for from what may be termed the minor operations.

In regard to the operation of arthrodesis, I have practised it in some 30 cases involving the knee and in 27 involving the hip-joint. These operations have been carried out too recently to make it possible to assess their final value.

The operation of excision of the knee to produce bony ankylosis is a straightforward one and need not be further discussed. Its immediate results are certainly most satisfactory, and from general experience the fixation does not appear to involve severe stress on neighbouring joints.

In the case of the hip an arthrodesis is not so easily

effected by operation. After the trial of several methods, I have come to the conclusion that it is best to approach the joint by means of the Smith-Peterson incision. The head of the femur is completely dislocated forwards after incising the capsule of the joint; the head of the bone is then denuded of all cartilage and the compact bone cut away with the broad gouge until cancellous bone is exposed; the acetabular cavity is then treated in the same way. The clearance of the acetabulum is not always easy in a stout patient, but is certainly simpler when the above described incision is employed than when the posterior or external route is adopted. At the completion of the operation, the head having been replaced in the acetabulum, the limb is fixed in a position of abduction and slight flexion in a plaster-of-Paris spica. In all cases in which there is much spasm of the adductors I tenotomize them freely in order to facilitate the maintenance of position. I have adopted the same after-treatment as is advocated by Mr. Elmslie.

I have carried out this operation in patients whose ages range from 30 to 70. My impression is that in young men it is the operation of choice. In older patients a certain proportion develop pain in the sacro-iliac joints and lumbar spine. I think that for these other cases the procedure advocated by Mr. Platt is a more satisfactory one.

It is often stated that operations of this nature are associated with serious shock; I have not experienced this complication in any instance either during operation or in the twenty-four hours following it.

V.—W. ROWLEY BRISTOW, F.R.C.S.,

Orthopaedic Surgeon, St. Thomas's Hospital.

I WOULD express myself in agreement with most of what Mr. Elmslie has said in his opening remarks.

With regard to the surgical treatment of osteo-arthritis of the hip-joint, I would emphasize the fact that it is absolutely necessary to assess accurately the patient's disability before deciding to perform a major operation on the hip. The question to be answered is: will such operation satisfy not the surgeon, but the patient? If the degree of disability is great, and above all if the pain is very severe and remains unrelieved by simple treatment, undoubtedly operation is both justifiable and indicated, and I would suggest that the amount of pain complained of should in most cases be the deciding factor. It must be recognized that the result either of excision of the hip or arthrodesis is not a perfect limb. Some speakers favour fixation, some excision. In my opinion, in younger patients fixation (arthrodesis) is the operation of choice, because the loss of hip-joint movement is to some extent compensated by movements of the lumbar spine. In old subjects I think excision gives the better result. The fixation of the hip in these patients, in some instances at least, gives rise later to pain in the lumbar spine and neighbourhood of the sacro-iliac joints, which pain may be as bad as that for which the operation was originally undertaken. I would agree that forcible mobilization under an anaesthetic and a weight-relieving calliper or walking appliance are methods which have great use, and for the application of which there is a large field.

With regard to osteo-arthritis of the knee, we are, I think, all agreed that arthrodesis of the knee-joint is a most satisfactory operation, and should invariably yield a good result. The pain is cured and the patient is enabled to get about with comfort. But in the case of marked changes in both knee-joints with fixed flexion deformity, is it justifiable to fix both knee-joints? My impression is that a patient so treated is better off than one with a deformed and painful knee, recognizing at once that the ultimate disability must be severe. I would like to hear an expression of opinion on this point.

With regard to the more tentative operations which have been mentioned it is difficult to be certain that any beneficial result is due to the operation. Naturally, a loose body or torn cartilage should be removed even in the presence of some degree of arthritis. But the mere opening up of a joint and washing it out should, I think, only be resorted to in rare instances.

VI.—SIR ROBERT JONES, K.B.E., C.B., F.R.C.S.

THERE are only a few points which I should like to emphasize in connexion with the treatment of osteo-arthritis. The first is the paramount importance of resting a painful joint. Incalculable harm is done by the advice which is sometimes given to move the joint for fear it should get stiff. In the earliest stage of trouble in the knee, in which the patient finds that he cannot fully extend the joint without pain, but that flexion is painless, the simple device of fitting a knee-cage which prevents full extension eliminates that part of the movement which is harmful, so securing the required rest without laying the patient up.

In later stages, for example in the hip-joint, cases are found with great deformity and but little pain, and vice versa. These require careful discrimination. In some cases there may be comparatively free mobility in certain directions with marked limitation of movement in another. This limitation of movement is often due to periarticular adhesions which cause pain when they are stretched. Hutton used to manipulate these cases, breaking down the adhesions, with great advantage to his patients. The condition is particularly common in hunting men, who often complain of the limitation of abduction. Manipulation to break down adhesions and increase abduction often enables these patients to sit a horse without pain.

In cases of arthritis of the hip of the hypertrophic type, with much pain which persists in spite of rest, open operation may become necessary. My experience of dislocating the hip in order to reshape the head of the femur is that it is provocative of much shock, which is a serious consideration, for these patients are usually elderly people. Therefore I would advocate an operation which can be performed rapidly without much shock.

In unilateral cases with free movement of the other hip a firm painless ankylosis is often the result to be found. Approaching the hip-joint by the Smith-Peterson incision, a large part of the head and acetabulum can be stripped of cartilage without dislocating the joint, and then, as firm arthrodesis is often difficult to obtain, I usually detach pieces from the ilium round the acetabulum to fill the gap between the head and the acetabulum.

In cases where both hips are affected with stiffness and pain it is desirable to have one movable hip, and also desirable to have as little shock as possible. If a rapid excision is required the same approach may be used as in that for arthrodesis; the neck of the femur is divided, the enlarged head removed, and the stump of the neck placed into the acetabulum. The limb is then placed in abduction. On some occasions I have produced a pseudo-arthrosis of one hip by removing about 1½ in. of the femur just below the great trochanter and placing a little muscle between.

In old people with very painful hips it would be sufficient to perform an operation in which the head of the femur need not be removed, and this would consist of a separation of the trochanter, a removal of a portion of the neck, and a fixation of the trochanter, with muscle attached, to the portion of the neck contiguous to the head which is not removed from the acetabulum.

With regard to ankylosis of both knees, my experience is that the disability is not so terrible as might be expected. In cases where both knees are stiff and painful I prefer to straighten one knee and ankylose the other in a slightly flexed position.

MR. ELMSLIE (in reply) said that the term "arthritis deformans" had been originally used in the suggested topic for discussion. It was conveniently wide. Treatment by rest and manipulation was left out of discussion by definition, but he employed these methods much. He had no anxiety over shock, which was avoidable by a good anaesthetic and immediate relief of pain after operation. After excision of the knee, plaster should be applied from foot to pelvis. Double ankylosis of the knee was not so terrible as people thought, especially in a child. Physicians should be educated to believe that patients would stand shock, that operations were simple and safe, and that excessive temporizing with mechanical defects was unsatisfactory.

ACUTE RICKETS IN LATE CHILDHOOD AND ADOLESCENCE.

BY

E. LAMING EVANS, C.B.E., F.R.C.S.

THE experimental work on the etiology of rickets in animals, leading up to that of Mellanby in 1918, and carried on since that date by a large number of investigators, together with the truly scientific methods for the prevention and treatment of rickets in infants afforded by Professor Pirquet to Dr. Chick and her colleagues in Vienna, has added fresh interest, not only to the question of rickets in infancy, but also to the sporadic cases of rickets occurring in late childhood and adolescence. In addition, the great war has afforded us increased material of late rickets, and has tended to elucidate the problem of the connexion between that disease and hunger osteomalacia.

The question arises: Have recent experimental and clinical observations brought us nearer to the solution of the problems whether late rickets can arise *de novo*, or is merely a recrudescence of an earlier rachitic state, and whether the etiology of late rickets is identical with the infantile form?

I have used the word "acute" in the title of this communication so as to include a general metabolic change and to exclude the ordinary adolescent deformities such as scoliosis, genu valgum, coxa vara, etc. In this sense it is synonymous with the term "florid" used in infantile rickets. I do not use the term as implying haemorrhages which are due to a scorbutic element coexisting with the rachitis.

The question whether acute rickets occurring in adolescence is a recrudescence of a former rachitic metabolic vice or is a new metabolic change has occupied the minds of former reporters. To differentiate the two conditions reliance has been placed upon the permanent stigmata of rickets as evidence of a former rachitic state. Briefly, such stigmata consist of stunted growth, shape of the cranium, rachitic deformities, especially of the long bones. No reliance can be placed upon family history, for we all know the parental surprise when the true nature of florid rickets is first communicated either to the careful or careless mother. But the milder forms of infantile rickets are so common and so readily curable with advancing age, leaving no permanent stigmata, that it is an impossible task to exclude a mild degree of early rachitic metabolic change at the time of life when late rickets is prone to occur. I should suggest that the real importance is to differentiate between the infantile form which has continued into late childhood uncured and in which the stigmata are so well marked as to be with difficulty unrecognized, and those cases of florid rickets which are unassociated with evidence of former rickets.

Definition.

The essential feature of rickets is a disturbance in the metabolism of the growing organism in which the calcium and phosphorus in the circulating fluid are unbalanced, in consequence of which calcium is no longer deposited in bone. The blood changes consist of a diminution in the organic calcium or phosphorus, or both. Normally, serum contains 10 mg. of calcium and 5 mg. of phosphorus per 100 c.cm. One or other may be diminished in rickets. Thus two forms of disturbance in salt equilibrium may be present: (1) Calcium may be low and inorganic phosphorus may be about the normal; (2) phosphorus may be low whilst calcium is about the normal. In the low calcium form of rickets the symptom complex of tetany is prone to occur.

The first detectable sign of rickets is probably the diminution of the inorganic phosphorus or calcium of the blood. A more systematic examination in the future may reveal that childhood is not infrequently the seat of a low calcium and phosphorus blood state, a pre-rachitic condition which only exceptionally proceeds to a state recognizable by *x*-ray or clinical examination of the bones as rickets. Hess[1] has pointed to a seasonal variation in the calcium and phosphorus contents of the blood, corresponding to the seasonal variations in the occurrence of rickets. Further observations are required on this point.

The subjective character of the changes in the soft tissues exclude their adoption as criteria of the disease, which is admirably demonstrated by the *x*-ray appearances of the ends of the long bones. The changes at the ends of the long bones are so characteristic and so easy of demonstration that they are now universally used as the criterion of rickets.

The *x*-ray appearances in the long bones in florid rickets depend upon the decrease of calcium salts and the increase in osteoid tissue. The shaft presents: (*a*) thickening of periosteum; (*b*) enlargement of medullary cavity; (*c*) abnormal curves, corresponding to mechanical causes. The epiphysis shows, in place of a definite well defined shadow, a cloudy area containing one or more ill defined centres of ossification. The diaphyseal end is ragged at its attached surface and is broadened, overlapping the epiphysis, especially upon its weight-bearing side. The cartilage of conjugation may show a linear ossification bisecting the cartilage into two thinner discs. It is an early sign of recovery, and is known as the line test.

As our present knowledge of the causation, prevention, and cure of rickets is based upon experimental work on animals and clinical observations on man, objection may be raised as to the identity of experimentally produced rickets in animals and that occurring in the human body. The evidence is overwhelming that the conditions are the same. The skeletal lesions are identical macroscopically and microscopically; the blood changes are the same; tetany may accompany both forms; the same remedies are effective in both.

Age Incidence in Rickets.

The age incidence of rickets is important in explaining the infrequency of cases of late rickets. The premature child is peculiarly susceptible to rickets, even when well breast-fed; the earlier premature child is more liable than the later premature child, and the explanation has been offered that the rate of subsequent growth is inversely proportionate to the age of the individual. In early infancy the same rule applies, and so on in childhood. Rickets only occurs during growth. The calcium and phosphorus blood contents become more constant and tend to smaller variations from the normal with increasing years.

Seasonal Variation in Rickets.

There is a well marked seasonal variation in the onset of rickets. Children born in the autumn are more liable to rickets than children born in the spring. Likewise rickets tends to a spontaneous cure during the summer months.

Geographical and Racial Distribution.

Certain facts are well established. The negro child in Africa does not develop rickets, yet the negro and Italian children in American cities are especially susceptible. Chinese and Japanese children rarely develop rickets. Esquimaux children are free, though they live in dark huts, and, for half the year, in Arctic twilight.

Our Present Conception of the Metabolic Change in Rickets.

The problem presents enormous difficulties for its solution. Two factors appear to be effective in regulating the salt absorption by bone tissue:

(*a*) A factor X, which is generally present in association with fat-soluble A and which has hitherto been generally known as fat-soluble vitamin A. The reasons that the antirachitic X and fat-soluble A are not identical have been shown by Hopkins,[2] who oxidized cod-liver oil for four hours at 120° C., destroying the A but not X. Cod-liver oil contains A and X abundantly. Butter contains A but very little X.

(*b*) A radiant energy, which is present in the solar spectrum and emanations from mercury-vapour quartz lamp. Thus, the addition of X to the diet, or of radiant energy to the environment, invariably cures rickets if established, or prevents its development without change of diet or conditions of life.

The human organism appears peculiarly dependent on the presence of this radiant energy or its equivalent in

the food; for rickets may develop when the organism is deprived of them even though the diet be what is commonly considered well constituted. Thus rickets is a deficiency disease in the sense that radiant energy or a factor X is deficient.

Applications of these Principles in the Study of Late Rickets.

The number of cases of late rickets recorded before the war were relatively few. Thus Looser[2] collected some 60 in 1908, of which two-thirds occurred in females and one-third in males. No etiological explanation has been forthcoming, though valuable pathological material was demonstrated. The reasons suggested for the infrequency are as follows. Diet is more varied and exposure to sun more certain. In this connexion it is interesting to note that the experimental production of rickets in older animals is attended with greater difficulty, and that animals in the wild state never develop rickets. The records of Higier,[4] and of Hutchison and Shah,[5] are therefore extremely instructive in this connexion.

Higier observed 8 cases of late rickets during the last years of the war in Poland. The ages ranged from 8 to 18; no signs of previous rickets were present. During the same period he observed many severe relapsed cases of infantile rickets and over 70 cases of hunger osteomalacia, at ages ranging from 19 to 56. One case, the youngest of the osteomalacia cases, aged 19, presented signs of late rickets in addition. He says:

"Nothing can be determined as etiological in the cases of late rickets except hunger and under-nourishment, and nothing helped so much as change and increase of the rations, together with cod-liver oil and phosphorus emulsion."

Discussing the relation of late rickets and osteomalacia he says:

"It is fairly probable, in view of the endemicity of both, of the similarity of their clinical pictures, and of their coincidence in time and place, that the late rickets and the early osteomalacia are pathogenetically closely related the one to the other, perhaps even identical."

Hutchison and Shah reported the following features from observations of cases of late rickets in the Nasik district of India:

(1) It occurs in the well-to-do and not in the poorer classes; the former obtain a much larger supply of fat-soluble vitamin.
(2) It occurs where the purdah or semi-purdah life is adopted.
(3) It occurs in females only.
(4) It occurs soon after the purdah life is adopted, without change of diet.
(5) It does not occur in the poorer classes, whose diet is inferior but who do not adopt purdah.
(6) In six cases, without change of diet or medicine, treatment on open-air lines relieved the symptoms.

According to our present conception of rickets the curative factors in the vicious metabolism were, in the Polish cases factor X, and in the Indian cases radiant energy.

I will now describe shortly two cases of late rickets, for the second of which I am indebted to Mr. W. R. Bristow.

The following case is under my care at the Royal National Orthopaedic Hospital.

Gerald P., aged 7½ years, was first seen in January, 1923. The history is that, in October, 1921, he had an acute gastro-intestinal illness, with which he was in bed for a fortnight. Three months later a swaying gait and weakness of the legs were noticed by the mother. He was an eight months child. As a baby he was not fed by the breast, but by cow's milk and lime water. He had had no previous illnesses.

Family History.—The height of the various members of the family is as follows: Father, 5 ft. 7½ in.; mother, 5 ft. 2¾ in.; sister Queen, aged 15, 5 ft. 1 in.; brother Derrick, aged 14, 5 ft. 6 in.; sister Rosemary, aged 11, 4 ft. 11 in.; Gerald (the patient) 3 ft. 5⅞ in.; sister Mosa, aged 6, 3 ft. 8½ in. A photograph of these brothers and sisters shows no deformity, but normally developed children. Gerald is thus the shortest member of the family, but can scarcely be considered as stunted by earlier rickets.

Gerald's Present Condition.—Head: Some flattening of the vertex; no undue prominence of frontal or parietal eminences. Teeth: First dentition said to have appeared normally, but teeth decayed early; at present permanent central incisors, upper and lower, are about half-way erupted. Thorax: Well marked rickety rosary. Spine, clavicles, and shoulders normal. Elbows: No carrying angle present; arm and forearm are in same axis in flexion and extension. Wrists: Marked enlargement of the lower epiphysis and adjoining diaphysis of radius and ulna. Hips: No physical sign of deformity. Knees: Epiphyseal and diaphyseal regions of femur and tibia enlarged. Genu valgum, 1½ in., and outward curvature of the tibiae, 2½ in., are present. The Wassermann reaction was negative.

This child has been treated for six months by cod-liver oil and a good general hygiene. In that time he has grown 3/8 in., and his improvement is shown by the series of skiagrams taken in January, April, and July. In these the lower end of the radius and ulna, the lower end of the femur, and the upper and lower ends of the tibia show changes typical of florid rickets. The shafts show normal curves only, which is strong evidence that if any rachitic process occurred in infancy it was slight and spontaneously cured. The condition of the upper tibial metaphysis is interesting—for one inch it shows an osteoporosis and a thinned cortical shadow. This portion would correspond fairly accurately with the growth of bone subsequent to his attack of intestinal disturbance in October, 1921. The centres for the great trochanters are diffused and ill defined. In the cartilage of conjugation between the femoral head and neck an intracartilaginous line of ossification is clearly visible on both sides and points to the commencement of a spontaneous cure by January, 1923, when I first saw him.

The second case is one under the care of Mr. Bristow, who has kindly permitted me to record it in conjunction with the above case.

J. G., aged 14½, came under observation in May, 1922. She suffered from infantile paralysis in infancy, affecting the right lower limb, and was in St. Chad's Home for seven years previous to May, 1922. Upon admission she showed distinct enlargement of the epiphysial regions of the wrists and ankles. There were no other definite signs of old rickets in head, chest, or back. She was treated with heliotherapy and antirachitic diet.

X-ray Report.

June 3rd, 1922. Wrists: Splaying of diaphysis and cupping with granular outline; active rickets. Ankles: Active rickets.
September 12th, 1922. Wrists much improved; still some activity.
December 12th, 1922. Wrists recovered.

Conclusions.

No definite etiological factor can be brought forward to explain either of these two cases. An acute gastro-intestinal illness appears to have determined the commencement of one, whilst the other began after seven years in St. Chad's Home. This may have been due to dietetic monotony, though no other cases are known to have occurred. Yet we must remember that, in infancy, an apparently well proportioned diet may produce rickets in one child and not in another under similar conditions of exposure to radiant energy. It is possible that the crippling effect of a paralytic leg may have rendered her exposure to radiant energy insufficient. Her attack was noticed during the winter months, when both the food contents of X and radiant energy are low; and it is worth while noting that such ultra-violet rays as supply radiant energy fail to penetrate ordinary window-pane glass. Esquimaux who live without radiant energy for half the year do not develop rickets because there is an abundance of X in their food. Negroes and dark-skinned Italians in cities are peculiarly prone to rickets, because the pigment of their skin insulates them from radiant energy in a somewhat similar manner to window glass. Cod-liver oil, rich in X, has a marked curative effect in these cases.

Higier's cases may almost certainly be ascribed to a monotonous low ration deficient in X, and perhaps accentuated by a deficient exposure to radiant energy caused by weakness. Rickets in Poland is rare. In Hutchison's cases X was abundant and absence of radiant energy was the sole cause. Removal from purdah and exposure to open air without change of diet cured the condition.

Whilst further facts must be collected before a definite cause of late rickets can be stated, there are reasonable grounds for suggesting that late rickets is produced by the same agents as infantile rickets—namely, an insufficiency of factor X or radiant energy, or both; that it is, in fact, a deficiency disease; and that it can be cured either by the addition of factor X to the diet or of radiant energy to the environment.

I am indebted to my clinical assistant Mr. Lambrinudi, F.R.C.S., for extensive bibliographical help, and to Dr. W. H. Coldwell for the radiographic investigations.

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DEFORMITIES OF THE OS CALCIS.

BY

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THERE are seven deformities of the os calcis which I should like, with your permission, to place before this Section. They may be divided into groups—those resulting from:

Traumatism—
1. Oblique posterior fracture.
2. Compression fracture.
3. Comminuted fracture.

Congenital Defect—
4. Overgrowth of the great process.
5. Overgrowth of the outer wall.

Disease—
6. Spurs.
7. Overgrowth of the epiphysis, etc.

TRAUMATISM.

Oblique Posterior Fracture.

The posterior part of the os calcis may be split off by an oblique fracture running from behind the articular surface downwards and forwards to the under surface. It is important accurately to diagnose the exact line of this fracture, and to obtain exact apposition of the fragments, as otherwise the posterior end of the under surface of the anterior fragment is apt to form a projection into the sole, which will compress the plantar digital nerves, and render walking difficult. The posterior fragment of the os calcis is pulled upwards by the tendo Achillis. Unless the tendo Achillis is fully relaxed by bending the knee and putting the foot in the equinus position it is very difficult to replace the fragments and retain the posterior fragment in accurate position. If this is not done the line of union of the bone is weak and is liable to be painful when stretched and walked upon. Such a fracture, therefore, must be completely replaced with the fragments in exact apposition, by fully relaxing the tendo Achillis.

In every injury of the foot an *x*-ray photograph should be taken. It is impossible to make an exact diagnosis of a fracture of the os calcis without the *x* rays.

Compression Fracture.

A second typical deformity which results from trauma is one where, as the result of jumping from a height—ten, fifteen, or twenty feet—and alighting on the heels, the os calcis is crushed, so that the distance between the upper and lower surfaces is diminished. The os calcis may be simply cracked internally, and here again it will be impossible to ascertain the exact position of the fracture without an *x*-ray photograph. The crushing may be slight, but in many cases not only is the os calcis severely compressed from above downwards, but at the same time the bone is expanded laterally, so that its transverse diameter is increased. It is this lateral expansion of the bone which may give rise to permanent symptoms of pain and discomfort. There are, of course, in such a fracture, as in every fracture of the os calcis, the usual signs of severe injury—pain, swelling, inability to stand or walk, ecchymosis, venous discoloration of the skin, pain on movement, and a deformity which sometimes can be perceived by the finger or by measurement.

After some weeks the immediate effects of the injury may have passed off, and the patient may be able to walk, but where the bone has definitely undergone lateral expansion he cannot walk long distances. He experiences a severe pain situated in front of the external malleolus. This pain may prevent the patient walking any distance with comfort. This symptom may continue for years, and the patient, if a soldier, may be totally incapacitated from marching, and if a civilian he will be prevented from taking walking exercise.

In cases of severe flat-foot in children the tip of the external malleolus impinges upon the outer surface of the os calcis, and as the bone is still incompletely ossified it slowly changes its shape, and the apex of the lower end of the fibula will slowly become flattened obliquely from within downwards and outwards, as the result of the pressure by it upon the outer surface of the os calcis. In adult life, however, the bone is completely ossified, and this moulding of the bone does not readily take place. The impingement of the lower end of the fibula upon the outer surface of the expanded os calcis gives rise to very acute pain on walking. Until this projecting surface of the os calcis is chiselled away the pain and disability will continue, notwithstanding the use of walking instruments and special boots. The condition is, in fact, incurable except by operation. Removal of this projecting surface off the os calcis cures the patient at once. It is an operation which I have done fifteen or twenty times, with an absolute cure in every instance. Under modern aseptic precautions the operation is perfectly safe. It is, of course, advisable that after the operation the foot should be retained in an everted position in plaster-of-Paris for some few weeks.

Comminuted Fracture.

The third type of fracture, involving the os calcis and tarsus, is one where this region of the foot has been extensively comminuted—for example, as the result of a perforating bullet wound. The under surface of the os calcis will often in these circumstances present an irregular mass of bone, rendering the sole of the foot convex instead of concave. After the necrosed fragments have been removed, the sinuses have healed, and the inflammation has subsided, there may still remain an irregular mass of bone projecting into the sole of the foot, rendering progression impossible. So long as this mass of bone is allowed to remain it will compress the digital nerves at every step taken. So disabling is such a condition, and so hopeless the outlook, that I have had under my care several cases where amputation of the foot has been recommended. These cases have been perfectly cured by the following operation:

An equilateral triangular flap of skin and subcutaneous tissue, whose base is half an inch from the outer border of the foot, and whose apex is at the head of the astragalus, is elevated and turned outwards. The plantar fascia and intramuscular septa are exposed. The posterior attachment of the plantar fascia is divided at the os calcis, and is drawn inwards. The under surface of the os calcis is reached through the external intramuscular septum. The periosteum is elevated from the under surface of the os calcis by means of a rougine. The flexor accessorius and deep flexor tendons being pushed inwards, the irregular mass of new bone is thereby fully exposed. It is chiselled away, and the concavity of the under surface of the os calcis is restored. The periosteal flap is replaced, the plantar fascia is sutured in position, and the triangular skin flap is replaced and sutured. By this method of operating the whole of the under surface of the os calcis can be thoroughly explored, and any irregular mass of bone which projects into the sole of the foot can be removed without damage to any nerve, vessel, or tendon. The wound heals by first intention and no discomfort results afterwards. In fact, a perfect cure is effected of the previous disability, for which amputation seemed to be the only remedy.

CONGENITAL DEFECT.

Overgrowth of the Great Process of the Os Calcis.

This is present in every severe case of congenital equinovarus, and is the result of absence of pressure upon the outer portion of the articular surface (Wolff's law). The outer border of the foot will be convex when this deformity is present. The clinical effects of this bony hypertrophy are such that even after the plantar fascia and the abductor hallucis have been removed, the intramuscular septum has been carefully dissected out, the internal lateral ligament has been divided, and the foot has been wrenched outwards, the outer border of the foot will still remain convex, and cannot be made to approximate a straight line. In every such case where the outer border of the foot cannot be made straight or concave, the great process of the os calcis will be found hypertrophied, and must be removed. This is best performed by an incision over the dorsal surface of the calcaneo-cuboid joint, about three-quarters of an inch in length, and below the level of the peroneus brevis tendon and external cutaneous nerve. The joint is opened, the dorsal ligament and the origin of the extensor brevis digitorum are detached from the dorsal surface of the bone for an appropriate distance backwards, usually from half to three-quarters of an

inch, a chisel is inserted, and the projecting portion of the os calcis is divided, elevated, and removed. A tube is inserted, which is removed in two or three days; the stitches are removed in a week, and the foot put up in plaster-of-Paris for two months.

Even in severe cases of talipes equino-cavo-varus the foot can be completely rectified by removal of half an inch of the os calcis. If when this amount of bone has been removed the outer border of the foot should still not be straight, more of the os calcis should be removed, even up to one inch. Should the outer border of the foot still not be straight, a portion of the cuboid should be removed. It is never necessary, in my opinion, to remove the whole of the cuboid. I have never seen a case of talipes equino-cavo-varus, even in an adult, where the outer border of the foot could not be made straight and the deformity entirely remedied by removal of the whole of the great process of the os calcis, together with a portion only of the cuboid, provided that all the tight structures on the inner part of the foot had been previously divided.

Overgrowth of the Outer Wall of the Os Calcis.

This deformity results in an obliquity of the upper surface of the os calcis, and is due to an increase of the vertical measurement of the outer surface. This condition is in some cases associated with an ankylosis between the astragalus and the sustentaculum tali. It is only met with in the most severe cases of long-standing congenital equino-varus, and is the direct result of long continuance of the foot in the deformed position. In such cases the os calcis undergoes inward rotation on an antero-posterior axis, and to rectify this tilting it is necessary to open the astragalo-calcaneo joint, and to remove a portion of the upper and outer surface of the os calcis. It may be necessary to divide the ankylosis which may have taken place between the astragalus and the sustentaculum tali. When this ankylosis is divided, and an appropriate piece of the upper part of the outer surface has been removed, the os calcis can then be rotated outwards and placed in its normal vertical position.

DISEASE.

The Development of Spurs on the Inferior Surface.

This deformity, an overgrowth of the tubercles on the under surface of the os calcis, leads to considerable difficulty in walking. These tubercles give attachment to the abductor minimi digiti and flexor brevis digitorum muscles. They may be so enlarged as to project as sharp points half an inch long. They may cause so much pain and discomfort in walking that no amount of padding in the boots, or wearing of thick socks, will relieve the pain. In such cases x rays must be resorted to, and if the spikes are found, they should be removed by operation. An incision should be made on the outer aspect of the heel, one and half inches forward along the outer border of the foot, and extending backwards round the posterior part of the os calcis. By this incision the whole of the posterior half of the inferior surface of the os calcis can be exposed without damaging any vessel or any nerve. The tubercles can be verified, and can be chiselled away at their attachment. Unless these tubercles are thoroughly removed, and the bone left flat, recurrence of the disability is not prevented.

Overgrowth of the Epiphysis.

This deformity, overgrowth of the posterior part of the os calcis, is much more common than is usually thought. It is becoming increasingly frequent owing to the violent athletic exercises which are at present indulged in at an early age. It is usually due to hypertrophy of the epiphyseal cartilage. The tendo Achillis, it will be remembered, is inserted into this epiphyseal cartilage, and constant violent contraction of the tendo Achillis stimulates and causes an overgrowth of cartilaginous bone at this part.

The osteophytic outgrowth may be so prominent that not only is it difficult to make the patient's boots fit comfortably, but as the result of excessive pressure and friction a bursa may be developed, which is liable to become inflamed, enlarged, and tender after a spell of exercises, even when that exercise has been of short duration. In one case which I remember the patient was laid up for ten days with acute pain and inflammation in this bursa every time she took a long walk. Many patients are compelled to have every pair of boots specially made to fit them.

The superjacent bursa may suppurate, or the epiphysitis may be so intense that in a tuberculous subject it may not only suppurate but may actually give rise to necrosis of the posterior part of the os calcis. In mild cases the application of tincture of iodine will harden the bursa and the skin over it and may prevent it enlarging. In other cases fomentations must be applied, and rest is essential. In every case the boots should be specially made. Should the bursa suppurate, and a sinus or necrosis result, the foot should be put up in plaster-of-Paris, with a window round the heel, through which the sinus can be dressed. Unless the foot is thus put at rest the sinus may continue for years. Should the sinus persist and a projecting mass of bare bone be found at the bottom of the cavity, the projecting necrosed portion of the os calcis should be laid open and removed by chisel. These sinuses should not be scraped—scraping only removes and destroys periosteum.

When this epiphyseal enlargement causes such an amount of inconvenience as to materially interfere with the comfort of the patient or his ability to undertake ordinary walking exercise the osteophytic outgrowth should be removed. The incision should be semilunar in shape, almost vertical, and placed over the outer surface of the os calcis. This incision extends down to the bone, the periosteal flap is elevated and turned backwards, and the projecting mass of the os calcis is exposed and removed. The periosteum is then replaced, the wound is sutured, and a small tube inserted. The tube is removed on the second or third day, the stitches are removed on the ninth or tenth day, and the foot is put up in plaster-of-Paris for three weeks, after which the patient may be allowed to walk about.

Violent exercise in the young may cause a hypertrophy not only of the posterior part of the os calcis but also of the lower epiphysis of the tibia, and an expansion of the interior articular surface of the tibia, and a flattening and enlargement of the upper articular surface of the astragalus.

Mr. Openshaw showed two skiagrams: (1) a lateral view of an os calcis showing this osteophytic outgrowth; and (2) a lateral view of the normal os calcis, showing that the posterior part of the os calcis behind the articular process should be level.

TRANSVERSE (SUPRACONDYLAR) FRACTURE OF THE LOWER END OF THE HUMERUS.

(Abstract.)

BY

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THE author said that he chose this subject because a considerable number of these fractures were brought to him for treatment, because they all presented a clear clinical picture, and because in the textbooks they were wrongly described.

Statistics were presented to show that the fracture occurred almost entirely in children under the age of 14 years, and that it was the commonest fracture of the lower end of the humerus. Its usual causation by a quite trivial accident in the position of forced hyperextension was commented upon, and the statement made that it could be produced readily in the cadaver.

Having described shortly the symptoms and radiographic appearances, noting especially that the lower fragment was usually displaced backwards and outwards, the author showed by means of radiograms, diagrams, and quotations that this fracture was described and figured in nearly every textbook as a separation of the lower epiphysis of the humerus, which was a great rarity, of which only a very few examples were known. By describing a quite common injury as something else which was very rare much confusion of thought was caused.

Treatment.

The treatment should be directed towards getting a perfect functional result—that is, one in which movement in all directions was just as free and strong as in the case of the unaffected limb. By suitable measures this could be

obtained in every recent case, and it should be the rule, not the exception.

Having described the treatment of a recent case by manipulation and by operation, the author described at some length the treatment of an old case by operation. Where reduction was not complete, or where no reduction had been made at all, as in a case he described, movement and usefulness might be severely impaired.

Remarks.

In every case in which the author had operated there had been a perfect functional result; yet a great many of the unoperated cases of other writers appeared to give poor results. He asked: Did not this indicate the need for more frequent operation? Was not the cause of the poor results in many cases the impossibility of reducing the fragments by manipulation?

The commonest complication of this condition was damage to the median, ulnar, or musculo-spiral nerves. His experience was that when a bony displacement was reduced the nerves recovered. If there was paralysis, and on examination the bones were found displaced, the rational treatment was to put back the bones first and observe if the paralysis recovered; if it did not, an operation on the nerve might be considered. Another complication was Volkmann's ischaemic contracture; but did not this only follow incorrect treatment—such as binding the supinated forearm tightly to the upper arm with the use of great force and adhesive strapping, under gas anaesthesia, and keeping it there for twenty-four hours in spite of the patient's groans and cries?

The author's conclusions were that:

1. The fracture occurred almost entirely in children.
2. It was the commonest fracture affecting the lower end of the humerus.
3. It could be caused by a quite trivial accident.
4. It was usually described as a separation of the lower epiphysis of the humerus, but this was a great rarity, seldom seen.
5. Many of these cases could not be reduced by manipulation, and a poor functional result followed.
6. They could, however, be reduced accurately by operation, and a perfect functional result obtained.
7. Operative treatment should therefore be employed far more often than at present.

Mr. Roth showed radiograms of eight cases, taken before and after operation.

THE TREATMENT OF CONGENITAL TALIPES EQUINO-VARUS.

BY

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TALIPES EQUINO-VARUS is the most common of congenital deformities, and there is usually little difficulty in its early diagnosis. The whole foot is curled inwards, the heel is drawn up, and there is definite resistance to the passive correction of these deformities. The only congenital deformity which may simulate this condition is metatarsus varus. In this case the fore-part of the foot is adducted at the mid-tarsal joint, but there is no inversion of the os calcis and the movements of the ankle are normal. I draw attention to this, not because the differential diagnosis is difficult, but because the treatment adopted is essentially different.

I propose to describe the methods I have found most effective in the treatment of congenital talipes equino-varus in the infant. The importance of early, efficient, and prolonged treatment will be emphasized by a consideration also of the results of delay in treatment, inefficient treatment, and the deformities and disabilities which sometimes result from treatment.

Treatment of Congenital Talipes Equino-varus in the Infant.

The first question that arises is, At what age should treatment be commenced? It is usually taught that the mother or the nurse should be instructed in the frequent manipulative correction of the deformity from the first day. My belief is that any effective manipulation, unless followed by fixation in the corrected position, is harmful. Manipulation to be effective must be painful, as it involves stretching of tight structures on the inner side of the foot. This tearing or stretching of tight structures is followed by a physiological reaction, which results in more fibrous tissue formation and stronger contraction. I believe that correction of the deformity by manipulation will be more effective if delayed until the general condition of the child will allow of forcible correction of the deformity, and the skin will allow us to maintain the position of correction obtained. I say the skin, because I know of no effective method of maintaining fixation of the foot in the infant without the application of strapping to the child's skin. In my experience a good average age at which to commence corrective treatment of club-foot is 3 to 4 weeks.

Duration of Treatment.

Perhaps before discussing the line of treatment to adopt it would be well to emphasize that we are dealing with a deformity in the treatment of which time is an important factor. It must be clearly explained to the parents that treatment will certainly extend over a period of one year, and that supervision will be necessary for at least two or three years. In favourable cases during the second and third years supervision will be necessary to strike the mean between permanent over-correction of the deformity—flat-foot—and the tendency to a recurrence of the original deformity. Flat-foot is often looked upon as a good result of the treatment of congenital club-foot. It is perhaps a less serious deformity. A recurrence of the varus is certainly less likely when a fixed valgus has been established, but the goal at which we should aim is the normal foot. It is for this reason, as much as to guard against the possibility of relapse, that constant supervision is necessary for several years to ensure the best result.

TREATMENT.

The initial deformity consists of adduction of the fore-part of the foot, and inversion of the foot at the sub-astragaloid joint, with plantar flexion of the astragalus and os calcis as a result of shortening of the tendo Achillis, posterior ligaments, and the posterior tibial muscles. For the correction of these deformities a definite routine must be adopted, and very considerable force applied, even in an infant.

The routine consists of correction of the adduction, correction of the inversion, followed later by the correction of the equinus position of the foot. This routine is obvious and generally accepted. Failure results more often, I am sure, from a lack of appreciation of the severity of the manipulation which an infant's foot will stand and which is necessary to obtain complete over-correction of these deformities.

In the correction of adduction it is important that the foot should be abducted at the mid-tarsal joint, and that the correction of the inversion should take place mainly at the subastragaloid joint. If the corrective force be transmitted to the astragalus, it will result in a forcible rotation of this bone in its relation to the ankle-joint. An apparent correction where this has occurred is always followed by relapse, however long treatment is continued. I feel sure that lack of appreciation of this point has been responsible for many relapses in experienced hands.

In our correction it is therefore essential that the astragalus should be the fixed point. This is assured if direct pressure be maintained on the outer surface of the neck of the astragalus, equal to that used to correct the adduction and inversion deformities. Clinically we know that we have a true correction of the deformity if a hollow be present in front of the external malleolus. The depression in front of the external malleolus will be more apparent when the equinus deformity also has been

corrected. This allows the body of the astragalus to assume its normal relation with the ankle-joint.

The calcaneo-cuboid joint is the main fulcrum in the correction of pure adduction. In correction of the inversion it is essential that counter-pressure should be applied to the outer surface of the neck of the astragalus. It is of the very greatest importance that no strain should be put on the knee-joint during these manipulations.

In practice manipulation may usually be commenced in an infant 3 or 4 weeks old without an anaesthetic. It will be necessary to maintain the position of correction obtained, and to repeat the manipulations once a week until full over-correction is present. The position of correction obtained must be maintained in the intervals between the manipulations. The method of fixation we adopt is that of strapping and internal splintage:

One layer of lint is placed over the dorsum and lateral borders of the fore-part of the foot. A strip of zinc oxide adhesive strapping 1½ inches wide and 16 inches long encircles the fore-part of the foot. The lint protects the lateral borders of the foot from pressure, and traction on the strapping upwards and backwards maintains the position of correction obtained. The foot is held in the corrected position while the adhesive strapping is applied to the outer surface of the upper third of the leg, and maintained there by another strip of adhesive strapping which encircles the limb at this level. A malleable metal splint padded with lint is then applied to the inner surface of the foot and leg, and its position maintained by strapping. This is an aid in maintaining the position of correction until the next manipulation is undertaken.

In a moderately severe case weekly manipulation for eight to twelve weeks will be necessary before the adduction and inversion are completely corrected. Reasons will sometimes arise where weekly manipulations are not practicable. It is then advisable to give the child an anaesthetic. Two or three manipulations under anaesthesia will usually suffice to produce a complete over-correction of the adduction and inversion, an interval of three weeks intervening between the manipulations.

When the child reaches the age of 3 or 4 months, my experience is that although the correction of the adduction and inversion is complete, the equinus deformity has failed to yield to manipulation. Further efforts to stretch the tendo Achillis and posterior structures should not be persisted in, as these tend to produce an apparent correction of the equinus rather than a true stretching of the tendo Achillis. The strain of manipulation bears after a certain point more on the mid-tarsal joint than on the tendo Achillis. The calcaneo-cuboid joint resents weight-bearing, so that persistent force should not be applied to correct equinus deformity where simple division or elongation of the tendo Achillis would allow true correction of the original deformity by manipulation. In my experience elongation or division of the tendo Achillis is necessary in the majority of cases.

It may be argued that stretching is ideal, and that elongation of the tendo Achillis leads to a retraction and diminished excursion of the calf muscle. On these theoretical points I agree, but practically I find that after a certain point is reached further simple manipulative efforts produce a convexity of the sole rather than a true descent of the heel. At the age of 4 to 6 months we therefore usually find it advisable to practise elongation of the tendo Achillis, and if necessary divide the resisting posterior ligaments.

The child will usually begin to walk at the end of one year. Walking when a position of over-correction has been obtained is an ally in preventing recurrence of deformity. The question of treatment during the second six months of life is important. When complete over-correction of the deformity has been maintained for two months, relaxation under observation may be allowed for a time. If there be any tendency to relapse, the over-corrected position should be maintained until walking is established. If there be no tendency to relapse, a normal weight-bearing position of the foot is maintained by plaster-of-Paris, and weight-bearing encouraged. Experience alone will teach us which patient should walk in the over-corrected position, and which in the normal weight-bearing position. Relapse will seldom occur if the over-corrected position is maintained. But if the child with freedom maintains the voluntary power of dorsiflexion and eversion of the foot, the normal weight-bearing position of the foot should be encouraged.

When the child has walked for three months in plaster freedom may again be allowed under observation. Full dorsiflexion and eversion should be maintained during the night by a specially moulded splint. This may be made of plaster-of-Paris or celluloid. The important point is that its application should only be possible if the normal degree of eversion and dorsiflexion of the foot is present.

If there be a tendency to relapse, further fixation in plaster-of-Paris in the over-corrected position will be necessary for several months. The case which has shown a tendency to relapse may, on discontinuing over-correction by plaster-of-Paris, be fitted with a special cork insole. This is so moulded to the foot that it maintains the necessary degree of over-correction whilst allowing movement at the ankle-joint and exercise of the muscles controlling eversion and dorsiflexion of this joint. When the muscles controlling eversion and dorsiflexion of the foot are strongly developed, and the depression in front of the external malleolus is present, this insole may be discarded. Subsequent treatment will then be conducted on general lines.

Relapsed and Untreated Cases.

Relapse to the original deformity is a more difficult problem than the untreated case. Usually the same lines of treatment will be effective: an anaesthetic is necessary, and the use of the Thomas wrench allows us to impart the requisite force to our manipulations. This procedure will be repeated more than once if necessary. The resulting position of correction is maintained by a closely applied plaster splint. In most cases we must at first utilize the flexed knee to maintain the abduction and true eversion of the foot at the mid-tarsal and subastragaloid joints. It will be necessary to maintain this position of full correction for four to six months, when a short walking plaster may be allowed. When this plaster has to allow of walking with the foot in the position of dorsiflexion and eversion the fore and outer part of the sole should be thickened so as to give the child a flat surface on which it can walk. Sometimes it is found that the child walks in the short plaster with the toes pointed inwards, even though the true position of correction seemed to have been obtained.

There has been much discussion about the cause of this. Many hold that it is due to an internal rotation of the tibia and fibula below the knee, and that an osteotomy of these bones is sometimes necessary to correct this very troublesome deformity. My own belief is that this in-toeing is due mainly, I might almost say entirely, to a failure to obtain a true correction of the deformity. I think that the main cause is that the corrective force has not been entirely exerted on the mid-tarsal and subastragaloid joints, and that this force has been responsible for a rotation outwards of the body of the astragalus in the ankle-joint.

In early cases, where care is taken to maintain a pressure on the outer side of neck of the astragalus equal to the corrective force, this is practically an unknown complication. If it be present, the operation of osteotomy of the tibia and fibula, with the necessary outward rotation of the lower fragments, will correct it. The following operations are practised in selected cases to guard against relapse.

Transplantation of the Tibialis Anticus.—The natural action of this muscle is to dorsiflex and invert the foot. By its transplantation to an insertion on the outer border of the foot it will not only cease to be a factor in producing recurrence of the deformity, but will act strongly by its new insertion as a dorsiflexor and everter of the foot. Where a true correction of the deformity has not been obtained, this transplantation of the tibialis anticus will be helpful in preventing or delaying a recurrence of deformity. Where a true correction of the original deformity has been obtained it is unnecessary and will tend to cause a fixed eversion of the foot.

Bankart's Operation.—By this operation the position of over-correction of the foot is maintained by the insertion of a strong silk ligament passing from the outer border of the foot to the tibia. I was very much impressed with the clinical results which Mr. Bankart presented at a recent meeting of the British Orthopaedic Association. It is an operation which obviates the necessity of prolonged plaster fixation to prevent relapse. This gives it a definite place in the treatment of club-foot, when prolonged treatment and observation are not possible.

I have purposely included relapsed and untreated cases amongst those which should respond to treatment on general lines. In many of the cases generally looked upon as relapses the deformity recurs because a true correction has

never been obtained. In a small percentage of cases complete correction of the deformity is not obtained by manipulation and splinting, and other surgical measures must be adopted to complete the correction or relapse is certain.

In the case which comes under treatment early, failure to obtain a true correction should be very rare. When it does occur this is usually because the scaphoid has not been displaced from its abnormal position—that is, its relation to the inner surface of the head of the astragalus. The astragalo-scaphoid ligament may be so thickened and strong that no manipulation will restore the normal relation of the scaphoid to the astragalus. It is then necessary in the infant to free the attachments of the scaphoid so as to allow of its easy normal replacement. The head of the astragalus will assume its normal position on the inner border of the foot, and a true correction of the deformity is obtained. An alternative procedure is to remove the scaphoid entirely; this in infants may allow easy manipulative correction of the deformity. The after-treatment, whichever procedure is adopted, is to maintain over-correction until muscular balance has been restored.

In older children and in all adult cases resistant to milder measures, a satisfactory permanent result can be obtained by an operation which ensures arthrodesis of the mid-tarsal and subastragaloid joints in a good weight-bearing position. This operation has had a wider application in the treatment of paralytic deformities, but I have also utilized it in certain resistant cases of club-foot in children, where it seemed to me to be the operation of choice, and in many cases of adult deformity. The essential steps are: resection of the mid-tarsal and subastragaloid joints; division of the foot into three parts—(1) the astragalus and ankle-joint, (2) the os calcis, and (3) the fore-part of the foot; elongation of the tendo Achillis; removal of bone until easy complete correction of adduction and inversion of the foot is obtained. Fixation of the foot in the best weight-bearing position is maintained by plaster for six months. Walking in plaster may be allowed at the end of one month.

Deformities Resulting from Treatment.

Flat-foot.—This is usually due to a failure to appreciate the time at which fixation in the position of full dorsiflexion and eversion may be relaxed. Experience and constant supervision are necessary to avoid this.

Claw-foot.—Claw-foot may occur as a result of division of the tibialis anticus. The loss of this muscle may lead to a dropping of the fore-part of the foot and hyperextension of the toes due to loss of control of dorsiflexion of the foot resulting from division of the tibialis anticus and the effort of the extensors of the toes to replace this muscle. It may be overcome by correction of the cavus deformity by wrenching and the repair of the tibialis anticus or transplantation of the extensor proprius hallucis to the head of the first metatarsal bone. In older cases the best and quickest result will probably be obtained by a complete resection of the mid-tarsus.

Calcaneo-cavus deformity may very occasionally follow division of the tendo Achillis and prolonged dorsiflexion of the foot; it is a serious and progressive disability. If recognized early, repair or reinforcement of the tendo Achillis will prevent further deformity. In cases of well established deformity it may be necessary to resect bone to obtain a true correction. It will also be advisable to repair or reinforce the tendo Achillis in order to ensure the maximum restoration of function.

CONCLUSIONS.

1. Treatment of congenital equino-varus should be commenced at the third or fourth week.

2. Repeated severe manipulation of the foot will be necessary to overcome the inversion and adduction of the foot.

3. Correction of the deformity should be followed by fixation in the position of correction obtained.

4. When the adduction and inversion of the foot have been corrected it will usually be necessary to elongate the tendo Achillis to complete the correction of the equinus deformity.

5. Other surgical measures must be adopted unless full true correction of the deformity has been obtained by manipulation and elongation of the tendo Achillis.

6. Division of the tibialis anticus is not necessary and may lead to subsequent cavus deformity of the foot.

7. We should insist on descent of the os calcis by division or elongation of the tendo Achillis if necessary, but we should realize that prolonged dorsiflexion of the ankle may lead to non-union of this muscle with a subsequent calcaneo-cavus deformity.

8. In cases where simpler measures fail, a good permanent result may be obtained by a resection of the mid-tarsal and subastragaloid joints.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

RUPTURE OF THE KIDNEY:

DELAYED SYMPTOMS: OPERATION: RECOVERY.

THE case of injury to the spleen with delayed haemorrhage reported by Drs. C. R. and C. J. Gordon Taylor (November 24th, p. 962) leads me to publish the following notes of a case of ruptured kidney, on which I operated exactly a year ago, as it bears some points of resemblance and is, I think, a little out of the ordinary.

C. C., a boy aged 15, was admitted to the Murray Hospital, Blackhill, Durham, having been crushed between the mudguard of a motor delivery van and a lamppost. On admission he complained of pain in the left loin, the pulse was 126, and the temperature subnormal; there was severe bruising over the lower ribs and loin on that side, coupled with marked rigidity. I suspected that he had a ruptured kidney, but thought it possible that his condition might be accounted for by the shock and bruising; the pulse was taken every half-hour; the first specimen of urine, which he passed soon after admission, contained a little blood; there was none subsequently. He improved rapidly, pulse and temperature returned to normal within twenty-four hours, and he stated that he felt perfectly well; he remained in bed for four days, and on the sixth day after admission I examined him without detecting anything abnormal. Being by this time under the erroneous impression that he was well, I allowed him to go home on the following day, a distance of nearly two miles, which he walked.

I heard nothing of him for ten days, when I was asked to readmit him by his family practitioner. I can best describe his appearance by saying that his abdomen looked as if it contained a pregnant uterus at full term, which had been split in half; the boy was extremely cheerful, said that he felt in perfect health, his pulse and temperature were normal, and he walked down to the hospital. A few hours after admission he got up and dressed, while the night nurse was in another ward, and escaped from the hospital through a lavatory window; his parents brought him back on the following morning. He then told me that his abdomen had commenced to swell about three days after he had left the hospital, and that the increase in size had been gradual and caused him no inconvenience. On examination it was obvious that the swelling was due to a tightly encapsuled collection of fluid, extending from the diaphragm to the pelvis.

On the following day, under an anaesthetic, I made the usual lumbar incision for exposing the kidney; about four pints of straw-coloured serum immediately escaped, and at the bottom of the cavity I found the kidney, quite pale and bloodless, completely divided at about the junction of the upper and middle thirds. I performed nephrectomy and left in a rubber drainage tube. Convalescence was uneventful.

I am still uncertain whether the collection of serum which I released was the remains of a haemorrhage or whether it was in the nature of an effusion due to the necrotic kidney acting as an irritant. The boy never felt any pain or faintness, except as an immediate result of the accident, and it was not until ten days after the accident that he noticed any alteration in the contour of his abdomen; by that time he had been leading a comparatively active life for six days, and so continued until his readmission to hospital, seventeen days after the original accident.

NOEL KEMM,
Medical Officer in Charge, Murray Hospital, Blackhill, co. Durham.

MELAENA NEONATORUM TREATED BY INJECTION OF PATERNAL BLOOD: RECOVERY.

IT is not a little curious that I should read in the JOURNAL for November 17th (p. 928) a description of a case not at all dissimilar to one I saw just eight days before—only the second I have had in a fairly extensive general practice of over forty years. This last case was the second child, of healthy appearance, and weighing a little over 7 lb. The labour was normal and easy; neither chloroform nor forceps was necessary. The child had been applied to the breast only twice when, thirty-six hours after birth, a copious discharge of blood was evacuated by the rectum. This was repeated three hours afterwards and before I was

able to visit. The treatment I adopted was a hypodermic injection of 4 minims of adrenaline solution; I had the child wrapped up in warm Gamgee tissue. When I saw him six hours later there had been another discharge from the bowel and a lesser one from the stomach; the child was blanched and the extremities cold. After again injecting 4 minims of adrenaline I followed it up with an injection into the abdominal wall (half on either side) of 10 c.cm. of warm blood which I drew off from his father's median basilic vein. There was no further haemorrhage, and although for a day or two he looked rather sickly he is in every respect well to-day.

Glasgow. JAMES HAMILTON.

A PRIMIPARA had been in labour for nearly forty-eight hours before forceps were applied. The child was born at 3.30 a.m. on November 11th; it weighed nearly 8 lb. At midnight on the following day I was informed by telephone that the child was passing blood from the bowel; there had been, I was told, slight bleeding at 10 p.m., but at midnight it was sufficiently profuse to saturate the clothing and cot. I asked that the father be sent for and proceeded to the maternity home. While awaiting the father there was more haemorrhage, and several ounces of blood were vomited.

At 1 a.m. on November 13th I gave the baby an injection consisting of 8 c.cm. of paternal whole blood with 2 c.cm. of hot saline into the buttock. There was slight bleeding at 2 a.m., and at 4 p.m. several large clots were passed by the rectum; therefore at 7 p.m. I gave another similar injection in the scapular region. There was no further haemorrhage. Small quantities of sterile water were substituted for breast-feeding for forty-eight hours, during which period the child lost 2 lb. in weight. On November 20th the child was having full feeds, gaining weight, and the bowels were acting normally.

I was extremely fortunate in having this case in the local Corporation Maternity Home, where nursing assistance of the highest order is available. I am indebted to Dr. Bailey for permission to record this.

Stockport. F. J. KITT.

Reports of Societies.

CHRONIC ABDOMINAL PAIN IN NERVOUS WOMEN.

A SPECIAL discussion on chronic abdominal pain in nervous women was held at the Royal Society of Medicine on Monday, December 17th; Sir WILLIAM HALE-WHITE, the President of the Society, occupied the chair.

Dr. ROBERT HUTCHISON said that there had been some difficulty in choosing a title to indicate the type of case they had in view. He had suggested "chronic abdomen," but the term had acquired a somewhat special significance; a more descriptive label, "those painful women," had been applied in America. Every medical man, however, would recognize the class in question. The typical patient commonly referred her abdominal pain to the right iliac fossa; with this were usually associated pains in other parts of the body, headache, constipation, menstrual disturbances, and various superadded mental states; she was introspective, not infrequently peevish, and craved for sympathy. On examination she was found to be ill nourished and of bad colour; visceroptosis, the "kinks" described by Sir Arbuthnot Lane, and gastric atony were generally associated. In his (Dr. Hutchison's) experience they were usually members of the upper classes and had few absorbing interests in life. Certain definite lines of inquiry were presented. It was necessary to decide to what extent the condition was due to organic causes, and what measure of relief might be expected from surgical treatment; on the whole a surgical cure was often impossible and rarely hopeful. It was not unlikely that some of these women had a lower threshold for pain; or the pain might be entirely imaginary or of an hysterical nature—it was commonly exhibited as a means of obtaining sympathy. The relation of the physical to the mental element was important; the primary source was not always obvious. Other possible factors were the effects of an artificial menopause or of repeated abdominal operations, and the influence of environment in the widest sense of the term. There was little doubt as to the general lines of treatment. Endocrine therapy was of questionable value, and surgery rarely effected permanent cures. Piecemeal operations were definitely productive of harm, and the various "pexies" had not generally met with striking success. Psychotherapy was likely to be an accessory of considerable account. On the whole, their solution of a very real problem had not been very satisfactory.

Dr. J. S. FAIRBAIRN said that many of these cases were presented to the gynaecologist. In addition to the pains described by Dr. Hutchison, they commonly complained of pain in the back and of a left-sided subumbilical pain, which was attributable to a congested ovary or to inflammation of that organ. Laxity of the pelvic floor was frequently associated. Many of the women were obviously suffering from over-doctoring; they could be regarded from as many points of view as there were healers of different parts of the body and the mind. There was a quite definite gynaecologist's type; but this was represented rather by the poor and overburdened mother of a large family than by the childless unoccupied woman of the upper classes to whom reference had been made. In the former, the "tired mother," the fatigue factor undoubtedly played a large part; but the symptoms were not markedly different. Another type was the woman with one child who had "never been the same woman since baby was born"; in this class of case there was a feeling of lack of pelvic and abdominal support, although the confinement had been perfectly normal. He generally advised these women to have another baby, but they rarely appreciated his advice—at any rate they never came to see him again. Undue importance had been attached to displacements of the womb; its position as such meant very little, and attempts to treat a complex condition by concentrating attention on that organ were futile. A radical change in environment was of the greatest importance in treatment; during the war he saw very few of these cases; since the war there had possibly been more than before. It was essential to restore the patient's confidence in her own body; this explained the apparently good effects of surgical treatment; if the operator and operatee were of suitable psychology the operation had a good effect on both! Frequent reassurance and restoration of the patient's physical condition, particularly her muscular tone, were invaluable; but there was no royal road to success.

Dr. JAMES COLLIER recognized four types of case. The first or hysterical type was quite distinct and often permanently curable. He described interesting cases of this class. The second type presented insane delusions and was uncommon. The third and fourth types were not infrequently associated. The one was characterized by a state of vigilant apprehension with undue tension and fear; although often a valetudinarian, her desire for health was constantly marked by anxiety. The symptoms were easily, though temporarily, removed by a dominant personality. The fourth and commonest type had physical cause for her sufferings; but that physical cause was almost invariably insufficient to account for the sum total of her symptoms. Consciousness of well-being was derived largely from sensations arising in the area of the splanchnic viscera. There was much truth in the ancient theories. In the majority of cases abdominal disorder was productive of almost ceaseless unrest. The source of trouble was probably a metabolic dyscrasia rather than a local abdominal lesion.

Dr. CRICHTON MILLER said that the vagueness of our knowledge of the etiology of these conditions was reflected by the palliative treatment only too commonly applied. The physically maladjusted were represented by three different groups. The amyotonic group was characterized by visceroptosis, etc., and tended to relapse; since all the abdominal organs were concerned, the only justifiable "pexy" was "panpexy." It was possible that the atonicity depended on calcium deficiency. The second or vagotonic group complained of chronic nausea with other associated symptoms, and suggested adrenal treatment. The

third or sympatheticotonic group included the spasmodic class; they were suffering from hyperadrenia and required mental treatment. Whether imaginary or not the pain was real to the subject and demanded treatment of some kind. There was a large class of case in which pain represented a defence mechanism. Analytical psychology provided a field of investigation of the utmost importance.

Dr. E. I. SPRIGGS confessed his outlook to be material. This was the result of his experience in dealing with a number of these cases at Duff House and Ruthin Castle. If pain were persistent and consistent, some physical cause was almost invariably found sooner or later on careful examination. The diagnosis of neurasthenia was usually wrong and invariably dangerous. The symptoms of definite lesions had also been wrongly attributed to auto-intoxication in many instances. Lesions of the biliary tract, calculi, etc., were frequently overlooked in this connexion. Adhesions were sometimes very painful, and there was always a possibility of relief by surgical operation. Where loss of tone, visceroptosis, and constipation were associated, the former was the primary factor. It was most important to devote plenty of time to treatment; this often meant a saving in the long run. In every case it was essential to investigate thoroughly and not to stress the nervous element. Surgical treatment, if indicated, should not be postponed. It was wrong to operate for visceroptosis as such.

Dr. M. CULPIN outlined his views as a psycho-pathologist. He first referred to the effects of continued emotional states in producing motor and secretory changes—the emotional dyspepsias. Motor and secretory disturbances also resulted from states of anxiety. The stance of the nervous child, described by Dr. H. C. Cameron, was also familiar in the nervous adult, in whom it was accompanied by visceroptosis. With respect to the craving for sympathy, it was difficult to imagine that intelligent people should have this particular end in view. It was important to remember that patients suffering from concealed obsessions frequently took refuge in expressed physical symptoms; the object of treatment was then to refer back the symptoms to their original plane. One of the dangers of "team" investigations by a series of specialists was the direction of the patient's attention to the various organs in the body, with possible transference of symptoms. The patient might not be conscious of the actual anxiety; at the same time she might recognize the cause of anxiety on the one hand and the secondary abdominal symptoms on the other, without associating the two. Generally speaking, there were two classes of case: the neuroses, in which continued emotional states had resulted in physical effects; and the psychoses, in which a purposive element arose.

Dr. J. A. HADFIELD regarded the physical basis as inadequate, although the conditions had nearly always originated in some form of organic disease at one time or another. Sensation might persist as an image; all pain was mental whatever its source. The majority of these hysterical conditions were due to disturbances in the sexual functions—not only to suppression, but also to such indirect causes as the fear of cancer, etc. Marriage was a common remedy, but by no means an invariable cure. Sex desires were not necessarily accepted as such. The craving for sympathy might be unrecognized and unconscious. Other hidden causes were jealousy; early sex traumata; sadism, the symptoms providing the patient with a means of tyrannizing over the household; and masochism, the symptoms resulting from an unconscious desire for pain.

Dr. T. STACEY WILSON considered that symptoms frequently arose from a hypertonic condition of the colon.

Dr. ROBERT HUTCHISON, replying to the discussion, said that two schools of thought had been represented. The psycho-neurologists had emphasized the fact that pain might be perpetuated for psychic purposes, whatever its original source; and it was certainly essential to recognize the mental side of the question. He regretted that no surgeon had given them an account of the results of colopexy and other operations.

Dr. FAIRBAIRN, in a brief reply, said that although colopexy had possibly not had a fair trial, it would probably disappear in course of time, as nephropexy had already disappeared, and hysteropexy was disappearing.

LANDMARKS IN THE TUBERCULOSIS CAMPAIGN.

A JOINT meeting of the Medico-Chirurgical Society of Edinburgh and the Tuberculosis Society of Scotland was held at Edinburgh in the Hall of the Royal College of Physicians on November 29th, Sir ROBERT PHILIP, President of the College, occupying the chair. An address was delivered by Professor THEOBALD SMITH of the Rockefeller Institute on "Some aspects of the tuberculosis problem from the experimental and comparative standpoint." In introducing the speaker the CHAIRMAN mentioned that Professor Smith had practically grown up with the department of bacteriology, to which he had contributed extensively by researches involving great technical skill. He had been a pupil of Pasteur and Koch, and maintained a wide vision with a philosophical outlook in all his pathological and bacteriological work.

Professor SMITH reminded his audience that during the last forty years three lines of attack on tuberculosis had developed—namely, (1) prevention, closing avenues of bacterial approach; (2) immunization, increasing human resistance by means of an antigen; (3) chemotherapy, along the lines used against syphilis, etc. Certain landmarks in the development of our present knowledge were pointed out, such as Villemin's experiments in 1865, Koch's discovery of the bacillus in 1882, the discovery of, and the claims made for, tuberculin in 1890, the discussions on the channels of infection, the results obtained by the speaker's experiments in differentiating the bovine from the human organism in 1898, and finally Koch's statement in 1901 as to the difference between bovine and human tuberculosis. Professor Smith then dealt with certain discoveries in comparative pathology which shed some light on some problems of the pathology of human tuberculosis. He had had the opportunity of studying 500 *post-mortem* examinations in cattle, and in this way had obtained a complete series of pictures extending from the early to the late stages of the disease. In most of the cases investigated the thoracic lymph nodes were affected, and it was possible to trace in this way the path of absorption from the lung tissue. The posterior lobes, analogous to the human lower lobes, were found to be the most common site of entry. The frequency of apical disease might be explained by the poor physiological position of the lung apices as compared with the lower lobes, where suppression of the disease probably occurred. Infection probably also occurred through the digestive tract at the same time. Indications were also present to show that secondary infections did not occur. Bovo-vaccination experiments were undertaken at Boston with human bacilli, and some degree of immunity resulted. Control experiments showed that bovine bacilli, introduced subcutaneously or intravenously, produced miliary tuberculosis, but similar injections into the vaccinated cattle only produced, after some lapse of time, a chronic bronchopneumonic tuberculosis without marked tissue destruction. Another series of experiments showed that although human tubercle bacilli will not produce definite disease in cattle, yet they may appear in the milk for years, and such prophylactic vaccination in cows is therefore impossible. Finally, he referred to the excellent results obtained by public health activities in reducing mass infection by bacilli. We become infected usually in early life, and develop our natural resistance so as to resist further infections. Three groups of individuals may be distinguished—namely, those with feeble natural resistance, those with good natural resistance, and those between these two extremes (the majority of the population). In the first group vaccination is useless, in the second unnecessary, but in the third vaccination may turn the scale by bringing about increased powers of resistance.

TUBAL PATENCY IN STERILITY.

AT a meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland held on November 22nd, with the President, Dr. LOUIS CASSIDY, in the chair, Dr. BETHEL SOLOMONS showed some modifications of Rubin's apparatus for demonstrating patency of the tubes in cases of sterility. He had been interested in Rubin's work for

some time and had used at first the flow volumeter which von Graefe favoured and which Dr. Theobald had lent to him. Two of his students, W. H. Ashmore and W. P. Murphy, had made the apparatus which he now demonstrated. The cases in which it was used were those of sterility in which it was impossible to ascertain definitely by bimanual examination whether the tubes were patent; he had also used it as a check on cases of resection of the tubes. There was no necessity for x rays, the manometer gave reliable knowledge as to the state of the tubes, and auscultation over the tubes determined the diagnosis. Adventitious sounds from the pubic hair and intestines might cause fallacies and the manometer must be chiefly relied on. Great care must be taken to exclude pus tubes, and it was unwise to dilate the cervix before inflating, for clots might block the tubes. He followed Rubin's teaching, and the rate of flow was a rise of 100 millimetres in fifteen seconds. In cases of patency the rise varied between 20 and 100, and in cases of blockage he never allowed the gauge to register more than 160. In only one case out of forty-nine done was it impossible to pass the sound because of extreme stenosis of the cervix. He had not met with any difficulty from escape of oxygen in the case of lacerated cervix when dealing with one-child sterility, neither had he found the tests fallacious in the pre-menstrual stage. Great care must be exercised in cleaning the sound.

The PRESIDENT said that he would like to know on what Dr. Solomons based this manometer figure of 100, and if he had used the apparatus in control cases of pregnant women. Regarding pus tubes, the settling time of serum in the body was an excellent way of determining whether pus was there or not. He considered this apparatus a good one.

Dr. GIBBON FITZGIBBON thought this apparatus might be particularly useful in cases which would be operated on for sterility, and in cases in which there was doubt about the state of the tubes, since by means of it it would be possible to see whether the tubes were patent or not; if the tube was thickened it was pretty certain to be blocked. If the manometer went up above 100, it generally rose to 200, but as a rule it kept between 70 and 90. He had found that if patients were given too much oxygen they suffered a certain amount of epigastric discomfort when they got back into the upright position, and therefore overinflation of the tubes must be avoided.

Dr. J. S. ASHE asked Dr. Solomons if, when using the apparatus, he had found much difference between CO_2 and oxygen.

Dr. G. W. THEOBALD showed a copy of the original apparatus, which he had brought from Vienna, and which was now being used in the Rotunda Hospital. In all cases in which they had opened the abdomen the instrument had proved correct. The cases in which it would be most advantageous were those in which the tubes were normal but the fimbriated ends were closed.

Dr. D. J. CANNON thought this instrument would be useful in case of acutely anteflexed uterus and in cases of erosion of the cervix; it was also a good method of dealing with stenosis of the Fallopian tubes as the result of infection. The instrument should not be used in the pre-menstrual stage.

Dr. R. J. ROWLETTE asked if this instrument was meant to be used for diagnostic purposes or for treatment. The one possible danger was that of conveying infection from the uterus to the tubes, and in many cases it must be very difficult to know whether there was infection in the uterus or not. He would like to know if there was any danger of bursting the tube, by bringing the pressure to bear on it too suddenly.

Mr. W. H. ASHMORE (who made one of the instruments shown by Dr. Solomons) said that the instrument was made bulky so as to enable it to hold one pint of water before the oxygen was put into it. There were two objectives served by this instrument: (1) to find out the patency of the tubes, and (2) to get a view of the peritoneum, so that afterwards pictures could be taken of it.

Dr. SOLOMONS, in reply, said that he regarded Rubin's work as a great advance in gynaecology; the apparatus shown was a valuable asset in gynaecological diagnosis. There was no need to determine the settling time of serum if care was exercised in excluding acute gonorrhoea and pus tubes. Transmigration of an ovum from one ovary to the opposite tube was possible though unlikely. In spite of what Dr. Cannon had said he intended to use it in the pre-menstrual stage until he found it misleading, but he would not employ it in any case of peritonitis. The instrument was used first for diagnosis and secondly for dilating the patent tube.

The PRESIDENT read a paper on "The education of the female child," and in the ensuing discussion the following took part: Dr. BETHEL SOLOMONS, Dr. ELLA WEBB, Dr. BRIAN CRICHTON, Dr. J. S. QUINN, Dr. R. J. ROWLETTE, Dr. G. W. THEOBALD, and Dr. D. J. CANNON.

The main points raised were coeducation of the sexes, the avoidance of constipation, the treatment of the menstrual periods, and instruction in matters of health.

A PATHOGENIC ANAEROBE IN TUBERCULOSIS.

THE second pathological meeting of the Liverpool Medical Institution was held on December 6th.

A note was read by Professor E. GLYNN, in association with Professor J. HILL ABRAM, on a case of acute miliary tuberculosis chiefly of the mesenteric glands, in which an anaerobic infection was also found. The patient had suffered from "influenza" twice during the past year, and also from pleurisy. Weakness had been increasing for six weeks before admission. He died three days later, the temperature having ranged between 103° and 105°. The lymph glands and spleen were enlarged, but there were no other localizing signs, except a systolic murmur at the apex. Blood cultures yielded *Staphylococcus albus* consistently. Red blood cells were 3,000,000, with a few normoblasts and megaloblasts. The white cells were 12,000 per c.mm., with a preponderance of lymphocytes. At the *post-mortem* examination eleven hours after death the ileo-caecal glands were found to form a mass the size of a hen's egg; they were haemorrhagic and contained large numbers of tubercle bacilli. *Staphylococcus albus* was also recovered from cultures. All other lymph glands somewhat enlarged. There were gas bubbles in the portal system and large numbers of Gram-positive bacilli in the liver, which proved to be of the *B. aerogenes capsulatus* type. The liver contained also typical caseating tuberculous nodules and haemosiderin. In the lungs was a patch of grey hepatization, in which great masses of organisms resembling pneumococci were present. A similar case of miliary tuberculosis affecting mainly the mesenteric glands, but without the *B. aerogenes capsulatus* infection, was described. The patient had not the anaemia of the pernicious type found in the first case. Of the four organisms detected at death the anaerobe was the most likely to have been the cause of this anaemia. Other cases were quoted in confirmation of the opinion that in this particular patient the anaerobe was present in the blood during life.

Professor HILL ABRAM and Mr. MORRISON thought the infection was probably a terminal one; the latter mentioned that the typical blood picture seen in *B. aerogenes capsulatus* infections was not present. Professor BEATTIE thought that the multiplicity of organisms present might explain the rapid multiplication of tubercle bacilli.

A note was read by Mr. JOHN T. MORRISON on the differentiation of human and bovine tubercle bacilli. Alluding to the need for a reasoned consensus of opinion on this subject, he proceeded to sketch the differences recognized between the two types and showed illustrative specimens of cultures and animal inoculations. Attention was drawn to the variations in results even in animal inoculations. Dean and Todd and others had shown the inaccuracy of Koch's original statement that animals could not be infected with human bacilli. In the rabbit the results of inoculation were usually conclusive, but variations here also suggested that the number of organisms injected might materially influence the decision. The findings of the Royal Commission with regard to the question of the stability of types were quoted, and the importance of exceptional cases pointed out, where by passage through animals or by culture methods definite changes of type had been produced. These observations supported the view of Besson and others that the two organisms were

essentially one, and the speaker was inclined to agree. At the same time, in animal inoculation they had a means of determining with considerable accuracy the immediate source of the infecting bacillus, and on such conclusions they were justified in basing public policy in the campaign against tuberculosis.

ENLARGED TONSILS AND ADENOIDS.

Sir James Dundas-Grant opened a discussion at the West London Medico-Chirurgical Society on December 7th, on vexed questions concerning enlarged tonsils and adenoids. He reviewed the various opinions that had been expressed as to their functions, and considered their protective effect when healthy, especially in the earlier years of life, and also their injurious influence when diseased. He raised the questions as to whether the presence of enlarged tonsils and adenoids predisposed to infection, and whether their removal afforded greater immunity. He had been able to have these matters tested in a London school of 1,000 children, with the following result: During 1923, 43 of the children had suffered from scarlet fever; 99 in the school had been noted by the school doctor as having enlarged tonsils and adenoids; of the remaining 901, 33 caught scarlet fever, or only 1 in 28; of the 99, 10 caught scarlet fever, or 1 in 10; of the 99 with tonsils and adenoids, 9 had had them removed and not one of these caught the disease. One little girl, aged 12, was persuaded with difficulty to have the operation in March, 1923. She escaped scarlet fever, although the other members of her family (two brothers) attending school had had scarlet fever since that date.

The results would seem to show that attention to enlarged tonsils and adenoids would diminish the incidence of scarlet fever, and since scarlet fever was one of the chief causes of acute rheumatism, with its attendant heart diseases, and chorea, it would lessen the incidence also of these scourges.

He considered that enucleation by dissection was the ideal operation, especially in cases of local or general infection, or when an insufficient operation had been previously performed; he found Norval Pierce's enucleator the most useful. He stated the case for preferring guillotine enucleation, especially if carried out in the upright position with a good reflected light, with the short anaesthesia (ethyl chloride), good view of the parts, slightness of haemorrhage, and rapid recovery. In cases where operation had been impracticable, he had found that iodine 6 grains, acetic ether 2 drachms, and glycerin 6 drachms, well shaken up, formed a pleasant and effective application. He had found also, by testing with starch, that the iodine penetrated the tonsils, probably owing to the presence of the ether. He advised great caution in the use of breathing exercises by children with obstructed noses in view of Muller's classical experiment, in which the pulse disappeared, owing to dilatation of the thoracic organs, when a strong inspiration was made with stopped mouth and nose.

The following took part in the discussion: Mr. H. Tyrrell Gray, Dr. F. J. Poynton, Dr. A. Saunders, and Dr. F. G. Lloyd.

At a meeting of the Aberdeen Medico-Chirurgical Society held on December 6th, with the President, Dr. G. M. Duncan, in the chair, Mr. Andrew Fowler read a short paper, illustrated by diagrams, on an unusual case of strangulated hernia with reduction *en masse*, rupture of the sac, and gangrene of a loop of small intestine about ten inches long. Operative treatment, including resection of the gangrenous gut and an end-to-end anastomosis, was completely successful. Mr. G. Gordon Bruce gave a clinical demonstration and a very full account of a case of cleido-cranio-dysostosis in a female of 25 years, and Dr. Alexander Low dealt with the morphology of the above condition.

A meeting of the Bath Clinical Society was held at the Royal United Hospital on December 7th, with the President, Dr. W. P. Kennedy, in the chair. Cases were exhibited illustrating the following conditions: osteitis deformans and arthritis treated by "protein shock," diabetes treated by insulin, idiopathic familial muscular atrophy, mixed-cell sarcoma of the sciatic nerve, and the operative treatments of sympathectomy, hip-joint pegging, and repair of the lower eyelid by a pedicle flap. Dr. Preston King read a paper on national health, dealing with the defects of the panel system and pleading for the necessity of a still closer co-operation between the medical profession and the State in the matter of preventive medicine.

At a meeting of the Yorkshire Tuberculosis Society held at Leeds on November 24th, with the President, Dr. Rennie, in the chair, Dr. J. L. Stewart, Tuberculosis Officer, Lancashire County Council, spoke on *x*-ray work as performed in a tuberculosis dispensary. He laid down certain general propositions: (1) *x*-ray methods were not infallible—small lesions could be missed; (2) on the other hand changes could occur within the chest without clinical evidence of the same; (3) a clinician must interpret the skiagrams. Pictures were then shown of hilus tubercle, or tuberculosis of bronchial glands, from cases of bone tuberculosis and from a series of contacts with sputum negative or absent; also of lesions masked by chronic bronchitis and lesions in diabetics. By means of the *x* rays improvement from treatment was demonstrated; complications like spontaneous pneumothorax and unsuspected pyo-pneumothorax were shown up; and non-tuberculous diseases such as aneurysm, valvular disease of the heart, cancer, and Perthes's disease could be excluded.

Reviews.

MUSIC, HEALTH, AND CHARACTER.

Dr. Agnes Savill has written a book on *Music, Health and Character*,[1] in which she narrates her adventures in the cultivation of her dormant musical sense in the hope that she may stimulate others to follow her example, and find, as she has, in the art of music an unexpected restorative alike for body and mind. The book is not intended for those who are advanced in the technique of music; it is not, indeed, so much an essay on music as a contribution to individual and social psychology. In his philosophic works William James was always insisting that the individual lives usually far within his limits; that he possesses powers of various sorts which he habitually fails to use; and, as he expressed it, he energizes below his maximum and behaves below his optimum. Such views permeate this volume; Dr. Savill is acutely conscious that modern life fails to provide for a great many people an adequate outlet for their original and personal gifts. A realization of this determines her whole psychological, or perhaps more accurately her philosophical, outlook. The thought in her mind she expresses as follows:

> "The majority of us pass through life in a condition of semi-torpor, with a vast reserve of talent which is never called upon or required by the small happenings of the daily routine. Many pass through life without once realizing the existence of the forces lying dormant within themselves."

The main problem of individual and social psychology is to discover how to set free and to utilize the undeveloped powers of the average man. Obviously the social conditions of modern life cannot be altered in order to provide inspiring work for the ordinary wage-earner. Some inner source of inspiration is necessary which will make a man independent to some extent of his circumstances, and which will give a new joy and meaning to life as a whole. It is the purpose of this book to show that music, like religion, philosophy, or devotion to some great cause, is capable of arousing the sleeping faculties of an individual, and making him conscious of the existence of the spiritual world from which he draws his moral strength.

Dr. Savill aims to show that music, rightly used, can be employed to improve the health, to increase the working capacity, to provide companionship, to strengthen the character, and enrich the mind. Her suggestions as to the therapeutic value of music in neurasthenia and depression, where the normal sources of energy are less readily accessible to the demands of the will, or there is present no emotional driving force within the self, are of value to the

[1] *Music, Health and Character.* By Agnes Savill, M.D. London: John Lane, the Bodley Head, Limited. 1923. (Post 8vo, pp. viii + 240. 7s. 6d. net.)

physician; and, as she points out, there are to be found brief but emphatic references to the healing agency of music throughout history. Of the several powerful influences capable of bringing about a stilling of inner strife, and strengthening a mind bewildered by chaotic thoughts and harmonizing the personality, she regards music as one of the most potent. More subtly, more rapidly, and more completely than any other agent which produces intense or high emotion, can music, Dr. Savill feels, bring about a change in the mental attitude. Her views call to mind the delightful biblical story of Saul and David: "And it came to pass, when the evil spirit from God was upon Saul, that David took an harp, and played with his hand; so Saul was refreshed, and was well, and the evil spirit departed from him" (1 Samuel xvi, 23). We may not have increased in wisdom since the days of old, but we have in knowledge, and Dr. Savill is able, in an interesting chapter, to enforce her arguments by references to the physiology of the emotions. Here she contrasts the effects of depressive or contractile emotions, such as anxiety and fear, which, when unduly prolonged, not only narrow the sphere of life but make for lowered vitality and disease, with those of the expansive emotions of joy and courage, which make for health, activity, and usefulness. She is of the opinion that music, with its power to replace the contractile emotions by those belonging to a different category, plays an important part for the assistance of suffering humanity. The physical effects on the organism of rhythm, expression, and harmony are fully considered in this connexion.

The views expressed in this volume have a special quality because they are based on the personal experience of its author. The story of her musical conversion is of great interest. Up to the age of thirty she was not merely indifferent to music: it aroused sensations of boredom and fatigue, and her attitude was one of active dislike. She came at length to realize that something was lacking in her, that some unknown sense required development, and experimented with much pertinacity to acquire an appreciation of the beauties of sound. The moment came when life was given to the notes which had hitherto seemed dead, and Dr. Savill felt that she had been given the key to a new language. After this she made steady progress, and by persistent study found out for herself what is really great and of permanent value in music. Dr. Savill has the gift of being able to depict in words those intangible and elusive emotions and feelings aroused by music. The charm of her narrative does not depend, however, only on her descriptive ability, but also on her obvious sincerity and lack of affectation. She describes what she actually does feel and think; she is completely true to herself, admits when she is bored, and endeavours by careful analysis and reflection to discover the cause of her discontent.

One general criticism of Dr. Savill's views may perhaps be permitted—namely, that she scarcely appears to take sufficiently into account the problem of individual differences. It is improbable that the mass of the people could be brought to her own level of musical culture, or even if they were that music would have the same spiritual significance for them. The meaning conveyed by music must be largely dependent on purely personal factors. Music, rather than a particular sort of music, is health-giving, and the simplest music—such as folk songs, popular airs, hymns, dances—may be as profoundly energizing and beneficial to simple (in a musical sense) people as the best classical music. We may perhaps even say that many great comedians have by mirth and song given a new outlook to life to many thousands of people and sent them to their daily task encouraged and refreshed. Whether music is used for the individual from the therapeutic point of view or whether it is considered from the social point of view it must be of such a character as to meet the needs of the person or persons for whom it is intended. What we think they ought to need or like must not be too much in the foreground.

We can unreservedly recommend this book. It does not contain a single dull page, and it may be described as an important contribution to social and individual psychology.

GRAPHIC RECORDS IN HEART DISEASE.

DR. S. CALVIN SMITH'S book on *Heart Records, their Interpretation and Preparation*[2] is described as an elementary guide for those who would investigate the most recent methods of heart examination. By far the larger part of the book deals with electro-cardiography, and the subject is treated in a most systematic manner. The student is taken over the various steps in the analysis of the curves in great detail and with the help of a lavish display of very clear graphs the reader ought to be able to follow the instructions with ease. Much information which will be of use to the beginner is offered in a very practical manner and should help him to avoid many pitfalls in the carrying out of the ordinary technique. Thus many useful hints are given regarding the management of the patient, the developing and printing of the records, while the author explains his method of filing and keeping them. The instrument described is an American model and much of the information regarding its care and operation, though general and applicable to any instrument of the kind, is of more value to one using the special apparatus described. There is no doubt that the book will be of considerable value in the author's country, where the public are more likely to demand cardiographic records with the idea that they are thus getting the last word in diagnosis. We have the feeling that a smaller book on the same lines would have been welcomed by many in this country when making their first attempts along this line of investigation.

A smaller section of the book treats of polygraphy, but it could well have been omitted as it detracts from the value of the book as a whole. The illustrative tracings are not good, the waves are not marked, and we feel that the beginner would be rather confused than helped by a study of this part. This is unfortunate, as the polygraph is the more convenient instrument for clinical work in private, and if graphic methods are going to help the general practitioner it will be to it rather than to the electro-cardiograph that he will have to turn. The book has otherwise been prepared with care and with an appreciation of the beginner's difficulties. It is well produced and profusely illustrated. To one already acquainted with this class of work it will be of little value; to anyone about to take up this branch it will provide many useful hints.

CATARACT EXTRACTION.

THE technique of cataract operation is a subject of perennial interest to ophthalmic surgeons, for the margin of success and failure is so narrow that any possibility of improvement in methods is worthy of attention. Practitioners in India have overwhelming advantages in this respect, for the number of the cases they have to treat is beyond comparison with the relatively small number in countries of temperate climates.

Colonel NEWMAN, I.M.S., has written a little book, *Irrigation in Cataract Extraction*,[3] which, however, covers much more than the title would suggest. It is in fact a miniature monograph on the whole field of the operation.

Irrigation in cataract operations is generally known as McKeown's operation, for McKeown of Belfast was a strenuous advocate of it, and his demonstration of cases will be remembered by those who attended the Belfast meeting of the Association some fourteen years ago. Others had tried the procedure, but he brought it into real prominence and demonstrated its value. The procedure has been in fashion and out of fashion more than once; the instrument makers' catalogues show some half a dozen patterns of nozzles employed by different surgeons, and Colonel Newman adds another to the number. His experience confirms that of other surgeons, which is that irrigation is of real value in many cataract extractions: first, in those where the operation has to be done for a senile nuclear cataract with unripe

[2] *Heart Records, their Interpretation and Preparation.* By S. Calvin Smith, M.S., M.D., Philadelphia. Philadelphia: F. A. Davis Company. 1923. (Med. 8vo, pp. xiii + 313; 128 figures. 7 dollars.)

[3] *Irrigation in Cataract Extraction.* By E. A. R. Newman, C.I.E., M.D., B.Ch.Cantab., Lieut.-Colonel I.M.S. Calcutta: Thacker, Spink and Co. (Cr. 8vo, pp. 124; 49 figures. Rs. 4/8/0.)

peripheral layers, and again where fragments of lens are detached from the main cataract mass. In both types of cases washing out, under the strictest precautions of asepsis and gentleness of handling, shortens convalescence and reduces the density of after-cataract that may require needling.

Some have asserted that the procedure adds to the risks of the whole operation, especially from loss of vitreous. Newman gives his figures for 1,000 operations. Vitreous was lost on 38 occasions; 18 were primary—that is, before irrigation was attempted—and were caused by high intra-ocular tension, lid spasm, and dislocated lenses; twice it occurred without any apparent reason. Of the others, 10 followed the use of capsule forceps, and 9 the use of the irrigator; one was accidental.

The author's account of his own experiences of cataract operations in general is of much interest and distinctly stimulating.

VITAMINS.

Vitamins: A Critical Survey of the Theory of Accessory Food Factors[4] is a translation by EDEN and CEDAR PAUL of a volume written by Dr. Ragnar Berg, director of the laboratory of physiological chemistry at Weisse Hirsch. Our knowledge of vitamins is so recent and is expanding so rapidly that any large book on this subject must inevitably be partly out of date by the time it is completed. In the volume before us this disadvantage is aggravated by the extra delay due to the process of translation. In consequence it only gives an account of the work done to the beginning of 1922. The translators' preface of eight pages contains a rather unrestrained eulogy of the book. They claim that it marks the close of an epoch in that the author has summarized all the enormous mass of original literature dealing with vitamins within the compass of a single volume, and has provided a platform for the work of future investigators. It is true that anyone who endeavours to cope with the flood of vitamin literature deserves sympathy and praise, but to write of such a compilation as marking an epoch is to misapply that overworked phrase. The list of references it contains is fairly complete down to the end of 1921, but there are only half a dozen or so for 1922. Altogether there are 1,500 entries arranged in chronological order, but, unfortunately, the references for each year are not given alphabetically, and the ease with which the list can be consulted is thus greatly diminished.

The author himself states that the main aim of his book is to stimulate the study of the science of nutrition by Germans, and he will have done a great service to his countrymen if he succeeds in directing their attention to recent advances; their acquaintance with this field of knowledge has, he says, been handicapped by difficulties in obtaining access to foreign literature during and after the war. In his introduction he raises several objections to the word "vitamin" as a general term to cover the unknown accessory food factors, and suggests and uses the term "complettin" instead of vitamin. Fortunately there is little fear of his example being generally followed; any such change in terminology at this stage could only lead to unnecessary confusion.

The book deals with the following main problems: the biological value of the various proteins; the importance of inorganic substances in nutrition; the various vitamins; and the deficiency diseases beri-beri, scurvy, malnutritional oedema, and pellagra. There is a chapter on the conditions of growth, and another on the importance of inorganic substances in nutrition, in which some interesting points are made concerning the absorption of calcium. We are unable to understand the statement, however, that potassium salts have a stimulating action on nerves and muscle (p. 81); it is true that they cause plain muscle to contract, but it is certain that they paralyse both nerves and cardiac muscle. There are good summaries of the knowledge of vitamins and deficiency diseases down to the date at which the book was written, and the chapter on malnutritional oedema is of particular interest. The discussion on rickets is unsatisfactory since the importance of light in its prevention is not recognized. The reason for the omission is, of course, that the new facts were published during the past eighteen months. The discussion on the causation of pellagra is confused, as may be judged from the concluding statement (p. 322):

"Perhaps a lack of bases in general, and a deficiency of calcium and potassium in particular, in conjunction with an excess of acids and a lack of organically combined sulphur, might in course of time induce the nerve degenerations characteristic of pellagra, especially if the before-mentioned faults in the diet were supplemented by the inadequacy of the protein it contained, by deficiency in respect of A, B, and D, and maybe at times also by deficiency in respect of C."

This passage raises a further point: In its original state the text was doubtless excellent German, but in the process of translation it has ceased to be German and has scarcely become English. This criticism unfortunately applies to other passages in the book.

The author concludes by a plea for State aid in the study of the newer aspects of nutrition since large laboratories, extensive zoological gardens, and a large staff of analytical, biological, and anatomical experts are needed, and these conditions are difficult to attain in universities in Europe. He pleads for some organization to ensure that the general public is made aware of the facts.

"In addition to institutes for the biochemical study of nutrition there must be institutes of nutritive hygiene, whose task it will be to ensure the practical application of the theoretical acquisitions of biochemistry, to ensure that the data of the new science of nutrition shall be realized in daily life. The consciousness of the masses must be permeated with a practical knowledge of the new science of dietetics."

This plea is undoubtedly sound, for there is every reason to believe that the effects of partial vitamin deficiency prolonged over several generations may very seriously affect the health of modern urban communities.

In conclusion it may be said that Dr. Berg has written an interesting general account of deficiency diseases, which, however, for the reasons we have suggested, is not completely up to date, but he expresses some ideas of his own on the subject of inorganic metabolism which are interesting, although in some instances they have not met with general acceptance.

SURGERY OF THE HEAD AND NECK.

THE book on the surgery of the head and neck by LENORMAND and BROCQ[5] is one of a series prepared by the Prosectors of the Faculty of Medicine in Paris, and intended for students preparing for examinations and for practitioners who, while they may be unable to obtain access to the larger works on surgery, are anxious to keep up to date. The volume under review is excellent. There is, as far as we know, nothing exactly like it in English. The size is convenient, the type large and clear, and the illustrations numerous and good.

In spite of its rather wider title, the volume is actually limited to operative procedures, but with this qualification we cannot speak too highly of the text. Each section is introduced by a clear description of the topographical and the deep anatomy of the part under consideration. After this, the indications which demand operative interference are discussed. As a rule only one method of operating is described, and we presume it is that which is followed in the practice of the authors; each stage of the operation is illustrated by helpful line drawings. The after-treatment also is fully considered. Certain operations have been included which would seem unnecessary, such, for example, as hemilaryngectomy and resection of the cervical sympathetics.

One criticism of the illustration work is demanded. In indicating the lines of excision of malignant tissue the incisions are shown dangerously close to the tumour. No doubt such an error would never arise in the authors' practice; but, if the volume is to be put into the hands

[4] *Vitamins: A Critical Survey of the Theory of Accessory Food Factors.* By Ragnar Berg. Translated from the German by Eden and Cedar Paul. London: George Allen and Unwin, Ltd. 1923. (Demy 8vo, pp. 415. 18s. net.)

[5] *Chirurgie de la Tête et du Cou.* By Ch. Lenormand and Brocq. Sixth edition. Paris: Masson et Cie. 1923. (Double cr. 8vo, pp. 338; 245 figures. Paper, fr. 10: bound, fr. 12.)

students and practitioners, a harmful impression may be conveyed. Apart from these criticisms the volume has impressed us as being a most valuable contribution to the "teaching" class of operative surgery literature.

NOTES ON BOOKS.

It was fortunate that when the aged tortoise at the Zoo was in a retrospective frame of mind his confidences were received by two such capable historians as Mr. KENNETH WALKER, F.R.C.S., and Mr. GEOFFREY BOUMPHREY, who have thus been able to give to the world a true and faithful account, with many spirited pictures, of the behaviour of the animals in the ark during the distressing days of the Flood. Through the courtesy of the aged tortoise they were directed to a cave in Armenia where long-forgotten records were concealed and where pictures were discovered which have been reproduced to illustrate *The Log of the Ark*.[6] It appears that life was very pleasant in the ark when the weather was fine, but the discomforts and anxieties were considerable during the period of heavy rain. Moreover, the happy harmony which it has always been assumed existed between all the voyagers in this remarkable vessel was, as the authors have shown, more apparent than real, for the wicked machinations of the scub introduced an atmosphere of distrust which added greatly to Noah's difficulties and almost resulted in disaster. This is a book for all children between the ages of five and ninety-five. Opponents of the higher criticism of the Book of Genesis could say nothing more censorious than that the *Log of the Ark* represents fiction founded on fact. It is an amusing and captivating tale, written in an original vein, and such as we all enjoy at this season of the year.

The British Journal Photographic Almanac[7] for 1924, the sixty-third issue, is again edited by Mr. GEORGE E. BROWN, and is on similar lines to those immediately preceding it. All things photographic are dealt with in this yearly publication, and the extensive advertisements cover practically everything which is used by photographers, either amateurs or professionals. These advertisements use up some 458 pages out of the 811 of the book, and the illustrations are numerous and excellent. An article on using a hand-camera by the editor should be of especial value to that numerous band of amateurs who confine themselves to snapshot photography, who for the most part do not trouble to make themselves acquainted with even the rudiments of the art, and have practically no knowledge of the limitations of this form of photography. There is an enormous amount of information upon such subjects as colour photography, printing processes, negative processes, photographic formulae, and so on; the result is that as a reference book it is invaluable.

A short but instructive book on the *Principles of Home Nursing*,[8] by EMMA L. MOHS, describes in simple language and accurate scientific detail how nearly a home nurse can approximate to the efficiency of a modern hospital nurse. Part I is devoted to sick-room nursing and gives information on home substitutes, chart keeping, and diets. Part II deals with emergencies and first aid. Part III has a well written chapter on reproduction and describes maternity nursing and the care of the infant. A short list of reference books on sex, heredity, and eugenics is included. Part IV explains bacteriology and immunization. There is a bibliography and a glossary.

[6] *The Log of the Ark*. London: Constable and Co. 1923. Price 7s. 6d.
[7] *The British Journal Photographic Almanac*. Edited by George E. Brown, F.I.C. Sixty-third issue. London: Henry Greenwood and Co., Ltd. 1924. (Cr. 8vo, pp. 812; illustrated. Paper, 2s. net; cloth, 3s. net.)
[8] *Principles of Home Nursing*. By Emma Louise Mohs, R.N., A.B. Philadelphia and London: W. B. Saunders Company. 1923. (Post 8vo, pp. 347; 123 figures. 10s. net.)

MEDICINAL AND DIETETIC PREPARATIONS.

A Dietetic Toast Biscuit.

THE preparation of articles of diet, perhaps the oldest of domestic sciences, has its settled rules. They have a certain affinity with those governing pharmaceutical operations, but pharmacy has not usually been applied to dietetics except in the production of medicated foods. These have seldom attained any degree of popularity; there is a natural aversion from medicine at a feast; but there is no reason why the preparation of ordinary food with pharmaceutical acumen and understanding, should not succeed both in the excellence of the product and a gain of public favour. Messrs. Macfarlane Lang and Co. have introduced a "Dinner Toast" biscuit manufactured in this sense for the use of persons with whom ordinary bread disagrees. A sample has been submitted to our analyst, who reports that it contains no medicament and no unusual baking constituent. The analytical examination agrees with the manufacturers' statement that the biscuits are made only from the finest wheaten flour with pure butter, malt, and milk. They were found highly palatable.

THE IMPERIAL CANCER RESEARCH FUND.

SCIENTIFIC REPORT.

THE eighth Scientific Report of the Imperial Cancer Research Fund which has just been issued[1] maintains the high standard of excellence that we are accustomed to look for in the publications of that institute. Some of the articles included in it have already appeared in journals during the two years that have elapsed since the last report: the majority of the papers are now published for the first time. As usual, the researches have been pursued along various lines with commendable thoroughness.

Carbohydrate Metabolism of Normal and Cancerous Tissues.

The first two papers are devoted to a consideration of the carbohydrate metabolism of surviving normal tissues and of tumours. This work of Dr. B. R. G. Russell, which is a continuation of previous studies on the metabolic exchanges of tissues, is of very great importance, for it is only by such means that we can hope to lay the foundations for a rational chemotherapy. In the first of the two papers certain normal mouse tissues were contrasted with different strains of transplantable tumours with regard to their powers of oxidizing glucose and other common carbohydrates supplied to them directly; no striking differences could be detected between the two classes, although tumours growing at different rates manifested variations in their carbohydrate metabolism. In the second paper, however, Dr. Russell relates how he succeeded in demonstrating distinct differences between normal and malignant tissues in their metabolism of pentoses. It was found that mouse tumour tissue had the power of consuming rhamnose, xylose, and arabinose, a property not possessed by any of the normal tissues investigated with the single exception of liver tissue, which could attack arabinose. To one unfamiliar with the technique employed it may seem that the magnitude of the changes recorded is small, and, as Dr. Russell himself suggests, it may not be safe to argue from phenomena observed in surviving tissues to what might occur in tissues in full activity; but still we have here for the first time an indication of a difference in metabolic properties which we may trust the author and his colleagues to explore thoroughly with the knowledge that everyone interested will wish them success.

Vitamins and Cancer.

Dr. W. Cramer's paper on dietary deficiencies and the growth of cancer is a thoughtful and original contribution to our knowledge of vitamins. His experiments with vitamin-deficient diets support the findings of Drummond and, being carried further, prove practically beyond a doubt that the growth of malignant tumours does not depend on the presence of the accessory food factors. It has hitherto been accepted, almost without question, that vitamins are essential for the growth of normal cells. If this were true it would denote a fundamental biological difference between the factors controlling the growth of normal cells and of cancerous cells, seeing that tumours grow just as well in animals deprived of vitamins as in the normal controls. But Dr. Cramer's investigations have led him to reject the popularly accepted opinion. He points out that there is a considerable gap between the observed facts and the generalization that every cell requires vitamins for its life and growth, and he shows that the atrophy resulting from a vitamin-deficient diet affects very specifically certain tissues or groups of cells, and further that deficiency in one vitamin affects one specific tissue, whilst deficiency in another affects an entirely different group of cells. Thus, absence of vitamin B leads to an atrophy of lymphoid tissue with consequent lymphopenia, and absence of vitamin A is followed by an atrophy of the intestinal mucosa, the other tissues showing no corresponding primary change, some of them indeed—for instance, the adrenal—actually undergoing hypertrophy. He compares this with analogous results following a diet deficient in tryptophane, in which case also transplanted tumours will go on growing. His conclusion seems reasonable, that the absence of vitamins affects certain tissues without which the whole animal cannot live.

[1] London: Taylor and Francis. Pp. 146; plates xlii. 20s.

There is no reason to believe that an abundant supply of vitamins in the food may be harmful to patients suffering from cancer, or, on the other hand, that the withholding of these could retard the progress of the growth. There are several other interesting considerations in this communication which will repay study: suffice it to say that the whole paper is a brilliant piece of constructive criticism.

Cultivation of Tissues.

Dr. A. H. Drew contributes two valuable papers on the cultivation of tissues *in vitro*, the first dealing with the conditions essential for the continued growth and differentiation of normal and tumour cells, and the second with an analysis of the growth-promoting factors. These substances have been found in much greater abundance in embryonic than in normal adult tissues and they are capable of passing through a Berkefeld filter. Autolysed extracts of normal adult tissues contain a similar growth-activating substance, while ice-cold extracts of tumours, not autolysed, yield it readily. It would appear that malignant tumour cells continuously form this substance. The observations are of prime importance and their significance will be readily appreciated.

Tar Tumours.

Dr. A. M. Begg, in a histological study of 140 tar tumours in mice, gives an interesting account of the modes of dissemination of these epitheliomatous growths. Several showed definite invasion of lymphatics and blood vessels, and no less than 18.5 per cent. gave evidence of spread along the perineurium of nerves. Doubtless this number would have been higher had serial sections been examined from each case. This mode of extension by nerves is rare, though not unknown in human cancer. Dr. Begg brings out the curious fact that in the mouse there is apparently a strongly specific tendency for malignant squamous epithelial cells to travel in this way, even in the case of transplants from the original cutaneous tumour. Other growths, such as adeno-carcinoma of the mamma, do not show this peculiarity.

Hitherto all attempts have failed to induce tumour growths of the skin of rats by tar or any of the other means that have proved successful in mice and rabbits. Dr. Russell has, however, been able to produce sarcoma in rats by weekly subcutaneous injections of tar over a long period. In one instance it took eleven months before there was any sign of growth, and in another case eighteen months, the injections in the latter case having been suspended at the end of a year. But once the tumour has started the development of the sarcoma is rapid. Dr. Russell holds that the neoplastic reaction is quite suddenly declared, as nothing in the way of any special preparatory phenomena can be detected histologically before the development of frank sarcoma. Although in the case of tar epitheliomata in mice a stage of simple wart formation is generally seen, there are some grounds there also for believing that the transition to malignancy is abrupt.

Resistance to Cancer.

The Director, Dr. J. A. Murray, discusses the questions of primary and secondary resistance to the induction of cancer. No adequate summary of his authoritative paper can be given here, as it is already so condensed. Refraining as much as possible from speculation, he brings into relationship the observations made on the experimental production of cancer by irritants and the observations of Drew already mentioned. "A certain amount of activating substance is probably produced by any kind of cell damage, and when by constant repetition this production has become automatic, proliferation will continue after the removal of the initial cause of protoplasmic disintegration. Temporary hypertrophies would, in this conception, correspond to the purely reactive production of activator, ceasing when the irritant is removed, benign growth to an autonomous production in small amount, and malignant growth to a more abundant production." According to this view the irritant does not produce its result by gradually breaking down the resistance of the economy to the unrestricted powers of growth of its constituent cells, but the cell acquires new properties or exaggerations of its normal activities which act disastrously to the rest of the organism. Dr. Murray develops further his thesis that the formation of one malignant tumour protects the individual permanently, or at any rate for a long time, against the development of a second primary tumour. The importance of these experiments lies in the indication they give "of a systemic constitutional change in the organism in which cancer has developed, a change which, if it could be recognized with certainty and rapidity, would enable us to recognize cancer in its earliest stages, and could we produce it without initiating new growth, would place in our hands a rational means of prevention." The reviewer, although impressed by the facts on which this conclusion is based, cannot wholly subscribe to the inferences so persuasively drawn; but, however that be, the experimental facts conclusively show that there is no constitutional liability to the development of cancer.

Paraffin Dermatoses.

The report ends with a detailed account of the occupation dermatoses of the paraffin workers of the Scottish shale industry by Dr. Alexander Scott of Broxburn. It may be remembered that Dr. Scott contributed briefly his observations on these precancerous and epitheliomatous lesions at the Annual Meeting of the British Medical Association at Glasgow in 1922,[2] and we expressed a hope that he might give a more exhaustive communication than is possible in the pages of a medical journal. We are therefore glad to see that the Executive Committee of the Imperial Cancer Research Fund has afforded him the opportunity of recording "the results of an unintentional experiment on a large scale in the human subject, carefully observed and recorded over a long period. As the same favourable conjunction of material and observer is unlikely to recur, it was deemed advisable to make an adequate permanent record of it widely available." This is a merited compliment to both parties.

It would be idle to pretend that organized cancer research in this country has escaped adverse criticism at the hands of some publicists who apparently have neither watched its development attentively nor perceived the gradual unfolding of its objectives; to all such and to the impatient this report should be an effective reply.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee thirty cases were considered and £350 voted to twenty-two applicants. The following is a summary of some of the cases relieved:

Daughter, aged 77, of M.R.C.S. who died in 1878. She had been given a home and an allowance of £26 a year for some years by a cousin who died last May. Voted £26 in twelve instalments.

Daughter, aged 39, of M.R.C.S. who died in 1902; has supported herself as a governess. Her expenses during six months' unemployment were about £52, and her total income about £70. She asked for temporary assistance. Voted £10.

M.R.C.S., aged 60, who had to give up practice in 1892. Down to 1921 applicant's board, lodging, and attendance were paid out of his annuity, supplemented by friends' gifts and help from a brother who is now unable to continue it. The Committee voted £26 in twelve instalments for the third time.

Daughter, aged 70, of M.R.C.S. who died in 1870. Owing to chronic ill health applicant is unable to support herself. She lives with an old nurse and pays 3s. 6d. a week rent. Her only income is £20 from the Home for Incurables and the Old Age Pension. Voted £10 in two instalments.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., C.B., M.S., at 11, Chandos Street, Cavendish Square, London, W.1. The Royal Medical Benevolent Fund Guild still receives many applications for clothing, especially for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles. The gifts should be sent to the Secretary of the Guild, 43, Bolsover Street, W.1.

[2] BRITISH MEDICAL JOURNAL, August 26th, 1922, p. 381.

THE third number of the *Bibliography of Industrial Hygiene*, published by the International Labour Bureau at Geneva last September, contains a list of cinematograph films, of which a collection is being made. They will be classified under six headings: general conditions of life and work, agriculture, industry, commerce, emigration, and films for school use. In the present issue only some parts of the first heading are dealt with. The number also includes a list of 468 publications dealing with industrial hygiene which appeared during the preceding twelve months.

British Medical Journal.

SATURDAY, DECEMBER 22ND, 1923.

SLEEP.

"Happy is the man that findeth wisdom; his sleep shall be sweet."

THE immortals never slept. This we have on the authority of Mr. Bernard Shaw, and we are left to infer that a periodical retirement for recuperative purposes is the diseased product of a physical civilization. It would appear, therefore, that Methuselah and his kin had by one grand elevation of intellect—not unassociated, we suspect, with the discipline of a vegetarian dietary—divorced themselves from all affinities with the larger animal world. It may be that our inimitable dramatist is here making witting exposition of the physiological inability to fatigue nerve tissue, but more probably we are expected to concede that conceptions of the flesh are beside the point in a psychological dissection of the superman.

However this may be, the picture of an unsleeping immortality is not such as to commend itself to the aspirations of the human kind. The philosophy of every age has evinced a lively preoccupation with "Sleep, the lesser mysteries of Death." Whilst in the pagan mind is found all the child's terror of the mysteries of the night—

> "The children twain of dusky night,
> The dread gods Sleep and Death"

religions have found in sleep that rest and peace which is to be the guerdon of the faithful. The Oriental, seeking a perpetual sleep in Nirvana, makes common purpose with the Greek idea, which conceived the highest development of intelligence to be a negation of consciousness. From the nation which sought final rest on the bosom of Abraham arose the faith which assured that "He giveth His beloved sleep." For all his terror of the unknown, man has found no greater serenity than to yield to the seductive wooing of "queenly sleep," and has known no heavier punishment than that which Nature wields when she withholds sleep from the uneasy conscience or the uneasy body. As with Lady Macbeth, so with Brutus—"Since Cassius once did whet me against Caesar, I have not slept." Neither philosopher nor poet would seek to steal from us our bed.

> "Not of the Mortals sleep, nor of the Immortals,
> But blended of the twain."

Physiology has had little to add to the understanding of either the balm or the terror of sleep. We are at pains to prescribe the minimum requirement for child or for adult, while we cannot yet say wherein sleep is the "dear mother of fresh thoughts and joyous health." Medicine, whose chief handmaid is sleep, stands helpless by whilst the greater mystery snatches the life even from the arms of sleep. Professor MacWilliam, in a contribution printed at page 1196, brings to this problem criticism and suggestions which will seriously engage attention. He is disposed to question the comfortable view that sleep is a convenient degree of cerebral anaemia. The frequent occurrence of haemorrhage—cerebral, pulmonary, and gastro-intestinal—at night argues against a general reduction in blood pressure in these cases. Professor MacWilliam has previously suggested that sudden death by night may be due frequently to fibrillation of the ventricles of a debilitated heart, and now questions why this should occur and why anginal attacks should be common under the leisurely circulatory conditions reputed to obtain in sleep.

While it must be generally conceded that in deep undisturbed sleep there is a reduced blood pressure, a modified vascularity of the brain, and a depression of metabolism, respiration, and reflexes, it is suggested that in the uneasy sleep associated with dreams and nightmares a very different complex may be presented. The author discusses the evidence that such disturbed sleep may be associated with an elevated blood pressure, with pulmonary irregularity, with an augmented cardiac impulse, or with exaggeration of the lower reflexes. If such be of general occurrence it is not difficult to associate drastic lesions of the heart or vessels with their onset. It is suggested, indeed, that measurements of these circulatory disturbances which were made at the moment of waking from restless sleep pointed to a condition of stress exceeding that which was found in the same subject after indulgence in a short bout of moderate exercise. In Burton's *Anatomy of Melancholy* we find Lemnius quoted that uneasy sleep "causes dryness of the brain, frenzy, dotage, and makes the body dry, lean, and ugly to behold. The temperature of the brain is interrupted by it, the humours adust, choler increased, and the whole body inflamed." The great Galen himself writes that some sleep "overthrows the natural heat, causes crudities, hurts concoctions." Can we yet explain these observations?

While Professor MacWilliam leaves untouched the larger question of the cause of sleep, he is evidently inclined to suggest that the reduced blood pressure is an effect rather than a cause of sleep, or rather that the effect of sleep upon the circulation depends on the depth and the nature of the sleep. Although the crude analogy with anaesthesia cannot be upheld, it is significant that exaggeration or depression of the response of the lower centres follows the depth of anaesthesia.

Some readers may have had the privilege of hearing the address delivered to the International Congress of Physiology by Professor Pavlov last July. It is unfortunate that the remarkable studies of the Russian school on the physiology of the cortex are not yet available in any but the Russian tongue, and till this may be rectified the conception of conditioned reflexes and all that this implies will hardly achieve general recognition. In the address referred to[1] Professor Pavlov afforded some indication of the extension of these studies to the physiology of sleep, which gives the subject an entirely new orientation. Readers familiar with this school of thought need not be reminded that the cortex is held to be the seat of two contending activities—excitation and inhibition. A single "voluntary" action—the whole behaviour of the individual, indeed—is the expression of a balance between these two contending activities. The Anglo-Saxon differs from the Latin in the relative predominance of his inhibitory functions, and it may be a matter of some satisfaction to the northerner, therefore, that this does not imply a relative mental passivity, since inhibition is to be regarded as a process as positive as is excitation. Sleep, on this basis, becomes a spontaneous irradiation of inhibition over the cortex. The spreading may be to a greater or

[1] A report was published in this JOURNAL, August 11th, 1923, p. 257.

lesser extent complete, corresponding to a varying quiescence of the higher centres. Associated with incomplete irradiation of inhibition must be found areas of excitability, and these by inductance are regarded as being hyperexcitable. Under such conditions it does not seem difficult to believe that minor sensory or other stimuli falling on the active areas may give rise to exaggerated responses and by invasion of the inhibited territory may arouse the whole cortex to excitability and awaken the individual. This much seems established. On the other hand, one conceives that minor stimuli may fail to waken the sleeper, but, falling on excitable areas, may be transmitted to the lower centres to give just those extravagant responses which are to be found in disturbed sleep as described by Professor MacWilliam.

The outlook is fascinating in the extreme. To be able to look upon sleep as a positive active process is a real advance. The circulatory and other changes associated with the sleeping condition then become clearly effects rather than predetermining causes. Why do we "go" to sleep? What determines the initial irradiation of inhibition? This question remains to be answered. Is it itself a time-conditioned reflex? For all our conjecture he is still a fortunate man who can exclaim with Sancho Panza: "Only I know that whilst I am sleeping I neither fear nor hope, have neither pain nor pleasure; and well fare the man that invented sleep."

THE VIRUS OF THE COMMON COLD.

THE infective diseases of unsolved etiology are a field in which new knowledge is being sought actively to-day on every side and in many countries. To judge by the daily press, the general public takes almost as much interest in this branch of progress as the medical profession. We like to think that this popular interest is the outcome, not of mere curiosity, but of a wide appreciation of the fact that each new piece of knowledge, even when it has no immediate practical application, promises to bring us a step nearer to the time when the control and treatment of these diseases shall be far more efficient than is at present possible.

An endemic disorder of this category, of minor significance it is true, but for all that a prominent pest of modern town life, is the common infectious cold. Although for obvious reasons excluded from the list of notifiable infections, this malady from time to time during the winter months makes its appearance, and, by spreading through the town apparently unchecked until it has exhausted the susceptible material, acquires the proportions of a minor pathological scandal. Excluding the part it often plays as the precursor of respiratory maladies of graver import, the common cold must cause annually in the aggregate a vast amount of inconvenience, depression, irritability, and loss of working efficacy, none the less real because this disease has not yet acquired the dignity of official recognition. A further feature of the common cold is the comparative brevity of the acquired immunity that follows on an attack. Thus many people suffer regularly once a year, while some have two or more attacks, and those unfortunate individuals when they are enjoying a temporary respite and come by chance in contact with a person in the acute explosive stage of a cold know by repeated experience that their chance of escape is but small.

It would seem that the pathogenic agent responsible for the common cold has not yet been established beyond dispute. Thus while a number of well known bacteria, generally designated "catarrh organisms," occur in the respiratory discharges in catarrhal conditions of all sorts, and undoubtedly play an important part in the later stages of the common cold, it has been suspected for some time past that this malady is due primarily to some more elusive pathogenic agent; in short to some special principle *sui generis*. In favour of this view is the circumstance emphasized by Foster that during the earliest stage of the attack of common cold the nasal secretion is clear and remarkably free from bacteria of any kind when examined by the usual methods.

Since the common infectious cold is especially a disease of the human subject it was always probable that its etiology would be solved in the end by human experiment. The earliest observations on these lines appear to have been made in 1914 by Kruse,[1] who succeeded in transmitting colds by instilling into the nares of volunteers the diluted nasal secretion of an acute case after filtering it free of ordinary bacteria. In 1917 Colonel George Foster[2] of the United States Medical Corps repeated and confirmed Kruse's observation in some carefully controlled experiments on volunteers from an isolated garrison of soldiers, and succeeded in transmitting the disease, not only with filtered nasal secretion, but also with a culture in Noguchi medium obtained by inoculation with the filtered secretion. Foster, moreover, found some very minute "globoid bodies" in his cultures which he looked upon as probably the infective agent.

The latest contribution comes from the Rockefeller Institute, where Olitsky and McCartney[3] have carried out some experiments on volunteers with the filtered naso-pharyngeal washings in a number of cases in the acute stage of the common cold. In six separate instances where the secretion was taken before the eighteenth hour from the onset, transmission of the disease was effected by gently rubbing a swab charged with the filtrate on the nasal mucosa. Control experiments with the same material heated to 60° C. gave negative results. The incubation period varied from eight to forty-eight hours. In two further cases in which filtered naso-pharyngeal secretion taken after the eighteenth hour from the onset was inoculated the results were negative. Cultures of the filtered naso-pharyngeal secretion in Noguchi medium, and also in anaerobic blood-agar plates, failed to yield either the globoid bodies seen by Foster or the minute organism *Bacterium pneumosintes* found by Olitsky and Gates in similar cultures in cases of influenza. While several minute anaerobic organisms were cultivated, no organism was found that could be especially identified with the common cold. Experiments on rabbits with the naso-pharyngeal secretion from these cases of colds failed to produce the results obtained with similar material taken from cases of influenza.

These experiments, therefore, suggest that the active principle of the common cold belongs to the group of filter-passing viruses, and that the precise nature of the pathogenic agent here involved has still to be determined.

SIR CHARLES SHERRINGTON, Waynflete Professor of Physiology in the University of Oxford, and President of the Royal Society, has been elected a corresponding member of the Section of Medicine and Surgery of the Académie des Sciences, Paris, in succession to the late Sir Patrick Manson.

[1] Kruse: *Muench. med. Woch.*, 1914, lxi, 1547.
[2] Foster: *Journ. Infect. Dis.*, 1917, xxi, 451.
[3] *Journ. Exper. Med.*, xxxviii, 427, October, 1923.

ROCKEFELLER GIFT TO EDINBURGH UNIVERSITY.

THE University of Edinburgh has received from the trustees of the Rockefeller Foundation an offer of a capital sum of £50,000 for the erection of a clinical laboratory in conjunction with the Royal Infirmary, and for the completion of the endowment of the professorship of surgery on a full-time basis. The trustees have offered also an annual grant of £1,750 for five years, from which certain salary charges in clinical medicine and clinical surgery could be met. The offer was formally received by the University Court on December 17th, and negotiations will no doubt at once be opened with the managers of the Royal Infirmary. It will, we understand, be necessary for them to obtain more ground: they are already committed to a new *x*-ray department and other extensions of the infirmary, for which they hope to get ground in the neighbourhood. The erection of a clinical laboratory such as the Rockefeller trustees contemplate will, it seems obvious, make it necessary to obtain still more ground. There is also the question of a site for the new maternity hospital, which some desire should be in the immediate neighbourhood of the infirmary. We have no doubt that the difficulties will be overcome, for Edinburgh will not lightly lose such an addition to the teaching facilities of its medical faculty as is now made possible. This is the third great gift made by the Rockefeller Foundation for the advancement of medical education and research in Great Britain; the other two are the gift for the erection of the Imperial School of Hygiene in London and the grants made to University College, London, for the erection of the Institute of Anatomy, for additions to the staff of that department and certain others, and to University College Hospital and University College Hospital Medical School for the extension and perfecting of the facilities they afford for medical education, so that they may become an ideal medical school in London, equipped in all departments on the most modern lines. It was only last week that the Rockefeller trustees announced that they had granted one million dollars (£200,000) as an endowment for the maintenance of the medical faculty of Toronto University. For the last three years the University has enjoyed the income derived from this amount; the capital sum is now definitely handed over to it. The gift is made in recognition of the research work done by the medical faculty, culminating in the discovery of insulin.

SIR WILLIAM MACEWEN IN AUSTRALASIA.

THE boat on which Sir William Macewen sailed from San Francisco to Sydney on his way to the Australasian Medical Congress of the British Medical Association at Melbourne touched at Wellington, New Zealand, on October 10th, when Sir William, who was accompanied by his son, Dr. William Macewen, was welcomed by members of the New Zealand Branch. The boat arrived on October 15th at Sydney, where he was to have been entertained by Sir Walter Davidson, Governor of New South Wales, but that distinguished public servant had died on September 16th. On October 19th the students of the Sydney University Medical Society offered Sir William Macewen an official welcome in the great hall of the University; addresses were given by Dr. R. A. Money, president of the society, Professor A. E. Mills, dean of the faculty of medicine, and Professor F. P. Sandes, professor of surgery. After Sir William had replied the first verse of the 'varsity anthem was sung, and the meeting, which was attended by some 300 persons, resolved itself into a conversazione. On October 22nd he was entertained at dinner by the Glasgow University medical graduates. On October 25th, at a special meeting of the senate of the University of Sydney, the degree of M.D. (*ad eundem gradum*) was conferred upon him; the Chancellor, Sir William Cullen, K.C.M.G., presided, and there was a large attendance of members of the senate, of the professorial board, and of the profession. In introducing Sir William Macewen to the Chancellor Professor Mills, who is a member of the Council of the New South Wales Branch, sketched the eminent career of the new graduand and described the value of his contributions to science. Afterwards he was entertained at lunch in the Fisher Refectory of the University by the Warden and Registrar, Mr. H. E. Barff, M.A., C.M.G. On the same evening the New South Wales Branch gave a dinner in his honour, which was attended by some 101 members and by a number of guests, including the Premier of New South Wales, Sir George Fuller, K.C.M.G. On the following evening (October 26th) Sir William attended a meeting of the New South Wales Branch in the Anatomy Department of the University, when an address on a new operative procedure in the treatment of spastic paralysis and its experimental basis was given by Dr. N. D. Royle; it was illustrated by demonstrations on experimental animals and on the living man, and by moving pictures and lantern slides. Professor J. I. Hunter also gave an address, on the tonic influence of the sympathetic nervous system. Dr. C. H. E. Lawes, President of the Branch, both at the dinner and at the meeting expressed the satisfaction of the members in having among them Sir William Macewen, with whose name and work they were so familiar, and the gratification felt in the honour done to them by the Association in arranging that so distinguished a member of the profession should represent the Association at the Australasian Medical Congress in Melbourne, the first to be held under the auspices of the Branches in Australia. The State Government invited Sir William to make a tour as its guest, but time only permitted him to visit the wonderful and beautiful Jenolan Caves; to reach them he travelled by a car placed at his disposal by the Government through the Blue Mountains, a two days' trip there and back. As he was due at Melbourne on November 12th he was unable to accept an invitation from the Queensland Branch to visit Brisbane. The Congress was to begin in Melbourne on November 12th under the presidency of Dr. G. A. Syme, and we have made arrangements to publish an account of its proceedings as soon as it reaches this country.

CONGRESS OF THE BELGIAN CANCER LEAGUE.

A CONGRESS was held in Brussels from November 18th to 21st, under the presidency of Professor Depage, with the object of instituting the Ligue Nationale Belge contre le Cancer. It is apparent from the many lectures and demonstrations that the Ligue considers the most promising line of treatment to be by irradiation. With this belief, a great number of demonstrations of the exact technique for the use of radium and *x* rays had been arranged, and a considerable number of patients who had been treated by this method were collected. Of particular interest was the technique employed in the gynaecological cases, and it is specially to be noted that the gynaecologists associated with this work have given up entirely the use of Wertheim's hysterectomy for carcinoma of the cervix. Their present method of treating this condition is, briefly, as follows. First radium is applied in the vagina, by means of needles and tubes, for at least six days; a month later radium is placed in the pelvis through an abdominal incision, and left for at least six days; another month later the patient is treated by means of deep *x*-ray therapy. The Radium Institute in Brussels has only recently been founded, and therefore it is too early to say anything about final results, but it is possible to observe that those at the end of one year are truly remarkable. It is interesting to contrast the treatment carried out at this institute with that of the Radium Institute of Paris, where surgical procedures for

the application of radium are avoided as much as possible. The institutes have, however, one point in common—the workers at both believe that a moderate dose given over a long time, such as a week, is of greater value than a large dose given for a short time, say twenty-four hours. Other demonstrations included the treatment of carcinoma of the rectum by needles buried in the tissue around the growth, and of malignant disease in many other parts of the body, such as the tongue and breast. A somewhat novel technique for x-ray therapy of the breast is being employed by Dr. Sluys, who is burying a number of gold needles in the form of a gridiron in and around the growth while irradiating the tumour. The needles, of course, give off a number of secondary irradiations, which it is claimed intensify to a very marked degree the action of the rays. During the congress the evenings were occupied by gatherings of a social character.

PARASITOLOGY IN EGYPT.

In keeping with recent diplomatic pronouncements, there is taking place in Egypt a gradual replacement of European officials by those of Egyptian nationality. The ultimate success or failure of this policy will profoundly affect the well-being of the country, and in no department to a greater degree than in that of the public health. For several years past the Egyptian Educational Mission has pursued the enlightened policy of sending the most promising of the senior students of the law and medical schools to Europe for several years of post-graduate study, and has thus provided a personnel, trained at least from the academic side, from which appointments can be made. We are glad to learn that the Minister of Education has recently taken a step which, looking to the future needs of Egypt, is one which reveals a far-seeing statesmanship. Dr. Mohammed Khalil has been appointed subdirector of investigations in ankylostomiasis and bilharziasis in the Public Health Department. In order that the duties of conducting researches on the important endemic parasitic diseases may be adequately carried out in relation to the practical problems in the field, facilities as to material and for clinical observation have been assured by the allocation of six beds, which will be under the charge of the subdirector, in the large Kasr-el-Aini Hospital in Cairo. Another important step in this co-ordination of parasitological work is the appointment of the subdirector as lecturer on parasitology at the Cairo Medical School. It is to be hoped that the Veterinary and Agricultural Schools will be brought ultimately into the scheme, for the interrelation of the helminth parasites which affect man, the domesticated animals, and plants is very intimate, and any systematic attempt to study the one cannot omit to deal with the others. Dr. Khalil is to be congratulated on the well deserved recognition which the Egyptian Government has thus given to his contributions to helminthological research. An historic mantle falls upon his shoulders, for the land of Egypt is the home of helminthology, and has already been the happy hunting ground of Bilharz, Sonsino, Looss, and Leiper. As an undergraduate in medicine Dr. Khalil was a student of Professor Looss, and for some years after graduating he was a member of the group of research workers associated with Professor Leiper at the London School of Tropical Medicine, and during that period visited British Guiana as a member of the Filariasis Commission.

PARENTS' RESPONSIBILITY FOR MEDICAL TREATMENT.

The conviction at the Old Bailey on December 14th of Henry Norman Purkiss and Louisa Purkiss, members of a religious sect called the "Peculiar People," of the manslaughter of their son, aged 3 years and 3 months, by neglecting to call in medical aid when the child was suffering from diphtheria, serves as a reminder of a question dealing with the mental element in crime which remained unsettled until statute came to the aid of the common law. In such cases of parental neglect to seek medical aid a conviction was not always obtained, as was shown by the case R. v. Wagstaffe (1868), 10 Cox, 530, chiefly because of the application of the old common law maxim, "Actus non facit reum nisi mens sit rea"—that there cannot be a criminal act without a criminal mind. This maxim applied with especial appropriateness to the members of the sect of "Peculiar People," of whom there are 2,000, chiefly confined to Essex, whose faith forbade the seeking of medical aid on the ground of the text: "Is any sick among you? let him call for the elders of the church; and let them pray over him, anointing him with oil in the name of the Lord: and the prayer of faith shall save the sick, and the Lord shall raise him up; and if he have committed sins, they shall be forgiven him" (Jas. v, 14, 15). A short time after the decision in R. v. Wagstaffe the Legislature included a provision in the Poor Law Amendment Act, 1868, designed to meet such cases—"When any parent shall wilfully neglect to provide . . . medical aid"; and it was upon this express statement of the law that a conviction was secured in R. v. Downes (1875), 1 Q.B.D., 25. The Prevention of Cruelty to Children Act, 1894, omitted to restate this provision regarding medical aid, merely saying, "wilfully neglects such child," and in R. v. Senior (1898), 1 Q.B.D., 283, defending counsel argued that these words were not satisfied by proof of mere omission to provide medical aid. Lord Russell of Killowen, C.J., however, observed: "It would be an odd result if we were obliged to come to the conclusion that in dealing with such a subject as the protection of children the legislature had meant to take what may be described as a retrograde step; for the course of legislation and the provisions of the Act of 1894 show an increasing anxiety on the part of the legislature to provide for the protection of infants." The conviction was thereupon affirmed, but in 1908 Parliament thought it desirable to strengthen the law on the matter, and passed the Children's Act, 1908, Section 12 providing that "a parent or other person legally liable to maintain a child . . . shall be deemed to have neglected him in a manner likely to cause injury to his health if he fails to provide adequate food, clothing, medical aid, or lodging for the child." In R. v. Senior, too, the question was raised as to whether lack of means with which to obtain medical aid would be a good defence to a charge of manslaughter, but this is also provided for in the same section, which requires the parent to procure medical aid under the Poor Law Acts.

A MODEL MATERNITY AND CHILD WELFARE CENTRE.

About six years ago the Carnegie United Kingdom Trust, which exists to administer the philanthropic bequests of the late Mr. Andrew Carnegie, decided to select six thickly populated areas in the United Kingdom—three in England, and the others in Scotland, Wales, and Ireland—as places in which to build and equip model maternity and child welfare centres on the condition that the local authority in each place would provide the site and the cost of maintenance. Of these projected centres one at Birmingham and another at Motherwell in Scotland have been at work for some months, and on December 15th the centres at Liverpool and at Shoreditch in London were opened, the latter by Princess Mary, Viscountess Lascelles. Lord Elgin, in handing over the Shoreditch centre to the borough council on behalf of the Carnegie Trust, stated that the trustees were induced to select Shoreditch for the London centre not only because of its crowded population,

but because of the enthusiasm for this work which the borough had already shown. The first plans submitted to the Trust by the borough council would have entailed an expenditure of £100,000, and were thought to be too ambitious, and the borough council eventually submitted new plans to cost £25,000. This sum the Trust had paid for the building and equipment of the centre; the borough council had purchased the site (in Kingsland Road) for £6,000, and had agreed to maintain the institution in full efficiency. The building is quite a noble one in its architecture and decoration, in striking contrast to the poor, adapted buildings which so often serve this purpose. In the main hall, which is to be used principally for lectures and classes, dinners are to be provided daily for a number of nursing and expectant mothers. As an annexe to this hall there is a pleasant nursery where the children of these mothers will be minded. Along the side of the hall several small rooms open out, and these are to be used for antenatal and infant welfare consultations, while a dental clinic for mothers and for children under 5 years of age is to be opened shortly. On an upper floor there is a hospital ward for six infants suffering from disorders of digestion, and two small wards for mothers and infants to be used in special cases where the establishment of breast-feeding requires supervision. In the kitchen and laundry the work is done by electricity, and every contrivance there and elsewhere is of the most modern and approved pattern, including the ventilating arrangements and the "Eco" dry cabinets. At the opening ceremony a brief account was given by the Mayor of Shoreditch (Mr. A. T. Parry) of the progress of this movement in the borough, which formerly had an unenviable notoriety for its high infant death rate. The first health visitor was appointed in 1909, a second in 1912, and in the following year the Shoreditch "school for mothers"—a voluntary institution—was opened. At the present time there are six maternity centres in the borough, with five medical men and seven health visitors. A centre in Kingsland Road, a few paces away from the new building, was opened in 1915, but the premises soon proved inadequate, and the Carnegie Trust has now made it possible to erect in its place an institute of great dignity as well as utility, and one which should be visited by those interested in maternity and child welfare work.

INFLUENZA AND PNEUMONIA.

It appears from the weekly returns of the Registrar-General that the notifications of pneumonia and the number of deaths ascribed to influenza have recently been appreciably greater than in the corresponding period for 1922. The increase in the number of deaths from influenza is relatively heavy both in London and in the 105 great towns. In some of the large cities of Lancashire there is a small but definite increase in the number of deaths from influenza and a large increase of notified pneumonia. The age distribution of deaths is unlike that of the great pandemic of 1918-19, and resembles more recent experience and that obtained before 1918—that is, the deaths at ages over 45 form a large majority of the total. There is no sign of the sharp change of type, leading to excessive mortality in young adult ages, observed in the great pandemic. The number of cases of pneumonia notified has shown a tendency to increase for some weeks; in the first week of December there was a large increase in the north-western area; Yorkshire, which is usually affected early by respiratory epidemics, has now reported many cases. The notification rate this year, however, does not greatly differ from that of the corresponding weeks of 1922. It is unsafe to prophesy when influenza is in question, but there are at present no indications of anything more than a minor recrudescence of the interpandemic type. We hear of a considerable number of gastro-intestinal attacks occurring in London or among people who have recently visited London. The attacks are characterized by vomiting and diarrhoea, accompanied sometimes by great depression, which may persist for several days, or even as long as a week or ten days. The idea that there is a gastric form of influenza has been discredited, but Peacock in his classical description had little doubt about it. "Cases of this kind," he wrote, "may fairly be regarded as constituting a special form of the disease." The attacks he had seen, however, must have been of a more serious kind than have been observed recently, for he says that they were often complicated by jaundice, and by pains in the head, back, loins, and extremities, which might be severe. He went on to say that the headache was generally intermittent, and was accompanied by restlessness, agitation, loss of sleep, and some delirium. He mentions also epistaxis and profuse sweating.

A DEEP X-RAY THERAPY DEPARTMENT.

Our advertisement pages this week contain an announcement inviting applications for the post of whole-time radiologist to carry on work in the newly established deep *x*-ray therapy department at St. Bartholomew's Hospital. We understand that the deep *x*-ray therapy apparatus is being set up for the sole purpose of the treatment and study of malignant diseases, from which it is evident that the medical man chosen to take charge of it should be well acquainted with physics and have some experience of research. The appointment will be for a period of from two to five years, and it is proposed that the successful applicant shall spend the first three months of his term of office in visiting similar departments at home and abroad. As will be seen from the advertisement, the amount of salary depends on the qualifications and experience of the person appointed. We learn that a corresponding appointment has lately been filled at Guy's Hospital, which has been fortunate enough to secure a radiologist both able and willing to provide his own apparatus, and to undertake all the necessary work himself. Applications for the post at St. Bartholomew's Hospital must reach the clerk to the governors by February 29th, 1924.

TUBERCULIN AND THE TUBERCULIN DISPENSARY.

In our issue of December 8th (p. 1107) we published a leading article in relation to a recent essay by Dr. Camac Wilkinson on the tuberculin dispensary for the poor. The essay itself was a reply to a report made on his work by the Tuberculin Committee of the Medical Research Council. This report was stated in the preface of his book to be of a confidential nature, and at the time of writing we were unfortunate enough to overlook the fact that it had recently been handed to the *Lancet* for open publication, and was published in our contemporary's issue of November 3rd, 1923 (p. 984). For this oversight we tender an apology to our readers. In self-justification, however, we must say that even if we had had the benefit of reading this report it would have made no difference to the criticisms which we offered on Dr. Camac Wilkinson's work. We felt strongly that the evidence put forward by him was insufficient to support the conclusions which he reached, and after reading the report to the Medical Research Council we feel even more strongly that this evidence is defective. The case records do not appear to have been kept in such a manner as to allow of an accurate analysis being made, and until this is possible we must remain sceptical of any premature conclusions which may be drawn from them.

FOOD POLLUTION.

In their passage from the source of production to the consumer many articles of food are exposed to preventable contamination. It is difficult to understand why such contamination is allowed to continue, for it is not confined to dark, insanitary kitchens, bakehouses, and the like, only to be discovered by the vigilant health officer, but it is daily and hourly brought to the notice of the general public in shops, market stalls, street stalls, costermongers' wagons, and on railway stations. The consumer cannot claim ignorance of the conditions under which much of his food is supplied to him, and it really rests with him to demand an alteration in those conditions. The jeweller, the draper, the bookseller, the chemist, and even the ironmonger take the most scrupulous care against the soiling of his merchandise, all of which can be readily cleansed; but the baker, the butcher, the fruiterer, the fishmonger, and the grocer expose their wares to the dust and dirt of the street. On more than one occasion Dr. Charles E. Goddard, M.O.H. Harrow, has drawn attention to the many opportunities there are for a loaf of bread to become polluted between the bakehouse and the table. In a paper[1] to the Congress of the Royal Institute of Public Health in May last he returned once more to this subject, and pointed out that the obvious remedy was to place each loaf in a separate wrapper as soon as it is removed from the oven.. A machine has been devised for this purpose which is coming more and more into use in large bakeries in this country, and especially in the northern counties. The only objection raised to it on the part of the bakers is that it adds to the cost of production, and that the consumer is not willing to pay his share of that cost. To this Dr. Goddard replies that if waxed paper is used evaporation is lessened, and there need be no stale loaves, while incidentally no night baking will be necessary because the condition of a loaf a day old is indistinguishable from new bread, and deliveries need not be so frequent. If Dr. Goddard's contention is correct—and there ought to be no great difficulty in proving or disproving it—there is no valid reason why the delivery of bread in wrappers should not become the universal custom.

THE R.A.M.C. BADGE.

THE rank and file of the Royal Army Medical Corps have been wearing on their uniform, since the date of its formation in 1898, two badges. One was the familiar small red cross within a circle on the upper arm of the sleeve of the tunic and great-coat of the corps, and the other the badge with the rod of Aesculapius within a laurel wreath over the motto "In Arduis Fidelis," which was registered as the corps badge on its reorganization in 1898. The old badge of the Geneva Cross previous to that time was the distinctive badge of the Army Hospital Corps and Medical Staff Corps; it continued to be part of the uniform after the R.A.M.C. was formed. The Army Council has now decided to abolish the old badge as a distinctive mark on the uniform of the R.A.M.C., and to retain only the badge authorized as the R.A.M.C. badge in 1898. In time of war, however, the Red Cross brassard will be worn by all ranks, attached to the left sleeve, in accordance with the Geneva Convention of 1906. This brassard must be stamped and issued by competent military authority on the outbreak of war only, and will be worn by members of authorized voluntary aid organizations as well as by the officers and other ranks of the R.A.M.C.

THE *London Gazette* of December 18th announces that the King has appointed Sir Robert William Philip, M.D., to be one of the Honorary Physicians to His Majesty in Scotland, in succession to Dr. David W. Finlay, deceased.

[1] *Journal of State Medicine*, December, 1923, p. 585.

THE PRICE AND UNIT VALUE OF INSULIN.

ANNOUNCEMENT BY THE MEDICAL RESEARCH COUNCIL.

THE Medical Research Council announce that the retail price of insulin in this country is to be reduced by the manufacturers, after December 31st, to 12s. 6d. per bottle of 100 units. The price since July has been 17s. 6d., and before that the price was 25s. A reduction of 50 per cent. has accordingly been made since insulin first came on the market nine months ago. This is to be attributed to the increased efficiency of manufacture and to the larger scale of production following the growing demand.

It is of interest to compare the progressive reduction in price here with the corresponding fall in America. It must be remembered, however, that the American manufacture began some months before the British, that the demand and consequently the scale of production is larger there, and that advantages in respect of large slaughtering centres and lower cost of alcohol exist in America which are not enjoyed by the British firms. In April last the retail price in America, formerly higher, was 2d. per unit, or 2¼d. in an alternative dilution: the price here was 3d. per unit. The American price was then reduced to just over 1½d. per unit, and in July the British price fell to approximately 2d. per unit. A more recent reduction in America brought the price there to just under 1¼d. per unit, and the new British price is 1½d. per unit.

Some further reduction in price may be found possible by the manufacturers in the course of time as the scale and therefore the economy of production increases. It is not, however, to be expected—apart from the possibility of new sources or methods being discovered—that the price can ever be brought to a low level. The manufacture of insulin on a commercial sale involves the collection of large quantities of pancreas in very fresh condition, the use of large amounts of alcohol, elaborate and delicate chemical operations requiring skilled supervision, and careful physiological testing at different stages. The cost of such items must remain high in a process which gives a small yield of the final product.

The manufacturers of the American insulin announce an increase of 40 per cent. in the value of the unit of activity, and quite properly give a scale of dosage for their product revised in accordance with this increase. This announcement makes it advisable to explain the relation of the American unit to that adopted in this country. The Medical Research Council were made aware in August of this year of the discovery of a divergence between the unit adopted in Canada and that adopted by the manufacturers in the United States. They gathered that a proposal was under discussion to remove this difference by raising the value of the American unit by about 40 per cent. At that time American insulin had for a period not been in use in this country, and investigation showed that, during the interval, the value assigned to the British unit had been rising gradually, until it had become so nearly equivalent to the Toronto unit that a very small further adjustment was needed in order to make it correspond to the higher value which, in due course, came into force for the American continent. The value of the unit employed for British insulin is, therefore, already the same as that of the newer and stronger American issue; the only difference between the two countries, in this direction, has been that the value of the American unit has been suddenly raised, so that revision of dosage is needed, whereas that of the British unit has been allowed to rise by small stages, so that dosage has, in practice, adjusted itself. Henceforward all the insulin available in this country will, as originally planned, be standardized to the same unit.

The reduction of price mentioned above has been made in spite of this enhancement in the strength of the unit, so that the total effective reduction in cost to the patient is much larger than appears from the figures of price revision.

England and Wales.

MEMORIAL TO PROFESSOR DELÉPINE.

A MEMORIAL to the late Professor Sheridan Delépine was unveiled by Sir George Newman, the chief medical officer to the Ministry of Health, on Wednesday, December 12th, at the Public Health Laboratory, Manchester.

The memorial, which takes the form of a bronze bust and is the work of Millard, has been placed on the main staircase. The ashes of Delépine have all along lain in the building he founded, and the present memorial has been presented by his former pupils and colleagues. The bust bears the following inscription:

> Auguste Sheridan Delépine. Born January 1, 1855. Died November 13, 1921. Founder and first director of the Public Health Laboratory. Professor of Pathology 1891-1904. Professor of Public Health and Bacteriology 1904-21.

The ceremony was attended by Mrs. Delépine and her daughter, and a large and distinguished gathering of members of the medical profession.

Sir George Newman, in unveiling the bust, said:

It is fitting and appropriate that a memorial should be placed here to Auguste Sheridan Delépine to keep alive for generations to come the memory of his great public service to this University, this City of Manchester, and to the public health of the nation. Delépine was born in 1855, the son of a French father and a Swiss mother. He was educated in Paris and graduated in the University of Geneva as B.Sc. in 1872. His medical education was obtained in the University of Edinburgh, where he graduated with first-class honours in 1882. In 1891 he was appointed Proctor Professor of Pathology and Morbid Anatomy in the University of Manchester. The arrangements for the new pathological department at Manchester associated with the bacteriological laboratory were carried out under Delépine's instructions, and when later the connexion between the University Medical School and the Royal Infirmary became the close one it now is, he became the official pathologist. In 1901 he relinquished the post of professor of pathology and was appointed director of the new public health laboratories, thus becoming a pioneer in assisting a University with the training and work of the medical officer of health. In Dr. Niven, who came to Manchester in 1894, Delépine found a congenial and worthy colleague, and these two laboured together in a partnership of scientific and public work which has been of inestimable value to Manchester and the whole country.

As examples of Delépine's wider work may be quoted his investigations in connexion with the remarkable epidemic of poisoning from arsenic in beer in 1900; his studies in the bacteriology of milk; and his investigations for the means of disinfection of wool for anthrax.

Delépine was an indefatigable workman and laboriously conscientious, reluctant to publish his results until he was satisfied that his conclusions were valid and invulnerable. Taking him altogether, he seems to have compounded in himself some of the fundamental requirements of the new model of public health officer, to the consideration of which we may confidently invite the students of to-day and to-morrow. We cannot place Delépine alongside his incomparable fellow countryman, Louis Pasteur, yet it is not extravagant to say that he belonged to the same race and had in no small degree two of Pasteur's chief characteristics—love of truth and love of humanity.

It is a great and splendid thing for a university and city to have such a man as Delépine, and we do well to-day to enshrine his memory that generations of students may follow in his footsteps and climb up after him, and that every workman may work the better for his labours.

On the conclusion of the unveiling ceremony, the Vice-Chancellor, Sir Henry Miers, accepted the bust on behalf of the University as "a cherished memorial to one of our greatest teachers and investigators."

BRISTOL MEDICAL SCHOOL.

At the recent annual dinner of the Bristol University Medical School, held at the Grand Hotel under the presidency of Professor Walter Swayne, the guest of the evening was Sir Ewen J. Maclean, professor of gynaecology and obstetrics in the Welsh National School of Medicine. Mr. J. A. Nixon, dean of the Bristol Medical School, in proposing the health of the principal guest, congratulated the Cardiff Medical School on having now completed its organization, and referred to their guest's previous connexion with the Bristol Children's Hospital. Sir Ewen Maclean, in reply, read a message of greeting from the Cardiff medical students, and mentioned that when he was practising in former days at Bristol he came into touch with Dr. W. G. Grace, who often visited patients in the same street. He then proposed the toast of the Bristol Medical School, and the President's health was proposed by Mr. R. G. P. Lansdown, consulting surgeon to the Bristol General Hospital.

POST-GRADUATE COURSES IN LONDON.

The following arrangements have been made by the Fellowship of Medicine and Post-Graduate Medical Association:

Infants' Hospital, Vincent Square, S.W.—A further course in children's diseases, from January 7th to 19th, specially adapted to the needs of medical officers of welfare centres, and including clinical lectures, demonstrations, and visits to places of interest in connexion with infant welfare work.

St. Peter's Hospital, Covent Garden.—An intensive course in urology, from January 7th to February 2nd inclusive, consisting of clinical work and lecture demonstrations.

West End Hospital for Nervous Diseases.—A course of lectures on four afternoons in each week on the diagnosis and treatment of common diseases of the nervous system, from January 7th to February 11th, in the out-patient department, 73, Welbeck Street; there will also be clinical demonstrations.

North-Eastern Fever Hospital, Tottenham.—A series of eight demonstrations of the diagnosis and treatment of the acute infectious fevers, by Dr. F. Thompson, on Wednesday and Saturday mornings at 11 o'clock, from January 9th to 26th.

Copies of the syllabus of each of the above courses can be obtained from the Secretary to the Fellowship of Medicine, 1, Wimpole Street, W.1.

Scotland.

BRITISH MEDICAL ASSOCIATION'S RECEPTION FOR THE NEWLY QUALIFIED AT EDINBURGH.

THE Edinburgh and Leith Division of the British Medical Association on December 11th held a reception in the Hall of the University Union for those who were to graduate on December 14th. About 120 of the graduands were present, and were received by Dr. John Stevens, Chairman of the Division, and some 50 members accompanied by ladies. A copy of the *Handbook for Recently Qualified Medical Practitioners*, which has been prepared by the Association, was handed to each of the graduands. After tea, the Chairman, on behalf of the Association, made an expression of welcome into the ranks of the profession, and an address was delivered by Professor G. Lovell Gulland, C.M.G., the newly elected President of the Royal College of Physicians of Edinburgh, who referred to the special necessity under the changing conditions of the present time for union and co-operation between medical men. The organization which was capable of voicing the collective needs and wishes of the medical profession, and of obtaining attention to these, was the British Medical Association, and he advised them all to lose no time in joining it. With regard to the choice of a career, one of the first lines of life to which attention naturally turned was the public services, and among these he considered that the R.A.M.C. at the present time occupied a high place. He hoped that some of them would decide to adopt this service as a career. In all public services it was possible to lead an easy life, but promotion in the Services, as in all callings, came to the man who worked hardest. It must not be forgotten that the greatest of all public services was general practice, and this should be regarded as the highest and most interesting department of the medical profession. The general practitioner held a position of great honour in the community, for he was not only consulted in matters of illness, but he became the general guide and confidant of his patients in all affairs of life. The attitude of practitioners towards one another had changed greatly in recent times. In the past, social factions in small towns had often centered round the different doctors, who might not be on speaking terms with one another. Now, that had altogether changed, and doctors co-operated with one another in their cases, in doing holiday duty, and the like. It was a good rule never to listen to any remarks that a

patient made derogatory of another doctor. Professor Gulland impressed upon the young practitioner the necessity for being business-like in all he did. He owed this both to his patients and to his own dependants. It would be an admirable thing, if it were possible, for everyone before he began the study of medicine to spend a year in a commercial office, and learn, even if he did nothing else, the necessity for answering letters, for this omission was a special failing of doctors. With regard to women graduates he thought the best career open to them was in as many instances as possible to marry the male graduates. (Laughter.)

Some remarks on the present state of the Indian Medical Service were thereafter made by Sir Norman Walker, K.B.E., who introduced Lieut-Colonel McKendrick. The latter described some of his experiences in that Service. At a later stage in the meeting, Dr. J. R. Drever, Scottish Secretary of the British Medical Association, outlined some of the problems which faced the medical profession in the immediate future, and urged the desirability of every medical man being a member of this Association so that it might be completely representative of the profession. An excellent musical programme had been arranged by Dr. E. H. Cameron, and in the course of the afternoon Dr. Williams contributed piano solos, Mr. Walter Schlapp played the violin, and Mr. Purser sang. The reception, together with one held before the summer graduation last July, is a new phase of the British Medical Association's activity, intended to accord a welcome to the newly qualified practitioners at the outset of their professional life. It has already proved highly successful and much appreciated by the graduands.

Ireland.

INSULIN.

THE question of providing insulin for the treatment of poor persons suffering from diabetes has been under consideration by the Joint Committee of the British Red Cross Society and the Order of St. John of Jerusalem (Leinster, Munster, and Connaught). It was ascertained that the Government could not see its way to contribute towards the expense, although the Minister of Local Government expressed his sympathy. It was estimated that about £1,000 would purchase a sufficient supply of insulin to meet the needs of urgent cases for the present. After consultation with members of the medical profession the Joint Committee resolved to allocate a sum of £500 for the establishment of an insulin fund. Communications were opened with the Connaught antitoxin laboratories of the University of Toronto, Canada, and it is hoped to obtain a considerable reduction in the cost price for poor patients, and that a phial, sufficient for four or five days' treatment, which in the ordinary way costs 17s. 6d., will be supplied at 7s. 6d. An appeal is made to the public to contribute to the insulin fund, and Sir John Lumsden, Vice-chairman of the Joint Committee, announces that donations may be sent to the Honorary Treasurer, Red Cross Insulin Fund, 40, Merrion Square, Dublin.

BRITISH MEDICAL ASSOCIATION: ULSTER BRANCH.

The annual meeting of the Ulster Branch of the British Medical Association was held in the Medical Institute, Belfast, on November 29th. Professor Fullerton introduced the President for the ensuing year, Dr. H. W. Cuningham, Londonderry, who gave an address on nerve exhaustion. The war, he said, had interrupted the intercourse between Belfast and the outlying Divisions, but he trusted that closer relations were being gradually renewed. The strain of the period the province had passed through had affected the moral and mentality of the community, and signs of nerve exhaustion were universal. The causes, special and general, were manifold, but there was at bottom a less stable nervous system, and, frequently, a too excited childhood with a resulting hypersensitivity and the irritability of fatigue. Dr. Cuningham then dealt with the endocrine glands, the sympathetic system, and metabolism in relation to nerve exhaustion, and the great importance of the care, education, and home surroundings of the child, especially of the quick child and the child with poor circulation and timid nature. In the case of many children holidays were too full of excitement and with them it was the pace that killed. In addition to adolescence and the menopause, which were well known critical periods, infections and intoxications exerted an evil influence. In discussing mental symptoms, Dr. Cuningham laid stress on the necessity of becoming familiar with the early ones—irritability, inattention, erratic memory, indecision, suggestibility, and a general lessening in the higher powers. Blood pressure and the oxygen supply were connected with these symptoms. Frequently nerve tension was shown in the facial expression and position of the hand. Diagnosis was dealt with fully, and the principles of treatment, which should be enlightened, scientific, firm, yet with full real sympathy for the patient, not a mere slavish adherence to any one school, but common-sense, based on full knowledge and experience.

Professor Lindsay proposed, and Dr. Morrow seconded, a hearty vote of thanks to the President for his address, which was passed by acclamation, and suitably acknowledged.

MEDICAL CERTIFICATION UNDER THE INSURANCE ACTS.

The Irish Medical Committee has issued to all medical certifiers under the Insurance Act in the Irish Free State a memorandum dealing with Circular M.C./23 recently issued by the Irish National Health Insurance Commission. It includes the following observations:

Paragraphs 2-4 of the Circular deal with a Central Complaints Committee to be set up in connexion with complaints by Societies, etc., of lax certification. This Committee, to which such complaints may be referred by the Commission in certain circumstances, if it thinks fit, will be comprised of representatives of the profession and of approved societies with a chairman appointed from the Advisory Committee established under the Insurance Act (1191).

With regard to the issuing of ordinary certificates (Form M.C./1) in certain kinds of chronic ailments, the carrying out of the procedure explained in paragraphs 7 and 8 of the Circular will admit of the issue of certificates in such cases at longer intervals than a week, where the Society and the Certifier agree to the procedure. In case of disagreement as to the length of the interval, the Commission should be appealed to.

4. The issuing of the Medical Query form by approved societies has been discontinued and a new Form (M.C./X) supplied to Certifiers by the Commission, has been substituted for use in cases of *prolonged* illness where a Society desire a certificate in order to enable them to judge whether a member is capable of taking up some form of work, having regard to his condition of health and other matters bearing on the case.

It should be noted that a certificate on Form M.C./X should be issued only on the receipt by a Certifier, in writing, of a request therefor from an approved society. Such a certificate should not normally be asked for by a society in any case oftener than once in three months. In case of disagreement as to the length of the interval, the Commission should be appealed to.

Further, the giving of a certificate on Form M.C./X in a case of prolonged illness does *not* obviate the necessity of issuing the ordinary certificates (Form M.C./1), which should continue to be issued while the insured person remains incapable of work.

The ordinary certificate need not, however, be given in respect of a week in which a certificate on Form M.C./X is being issued.

Payment for each certificate given on Form M.C./X is to be made at double the rate for an ordinary certificate.

The Committee have been informed that some misunderstanding arose about the issuing of certificates on this new form, involving considerable correspondence between Certifiers, Societies, and the Commissioners, and it will be obvious, therefore, that in the interests of all concerned, the correct procedure as outlined above should be noted and followed in future.

5. Other points which were discussed by the subcommittee and which are mentioned in the Circular are:

(*a*) The necessity of Certifiers carrying a supply of certificates with them on their rounds for issue when necessary.
(*b*) Certification in cases where illness is due to an accident or industrial disease.
(*c*) Procedure when a certificate is refused.
(*d*) Issue of *final* certificates.

While the Committee feel that the overwhelming majority of the Certifiers discharge their duties properly as such, there have been undoubtedly certain instances in which the Commissioners' instructions on medical certification were not carried out. It is hoped, in the interests of smooth working, that in future all reasonable efforts will be made by every Certifier to carry out his certification work in accordance with the rules laid down by the Commissioners, whose advice should be asked for when any matter of doubt presents itself to a Certifier.

Correspondence.

THE REHOUSING OF SLUM DWELLERS.

SIR,—The account published last week (p. 1176) of Mr. J. J. Clarke's British Association paper on the rehousing of slum dwellers offers an entertaining exhibition of the mind of the Socialist. Like Lenin, Mr. Clarke recognizes that Socialism involves forced labour; but unlike Lenin, he still believes in the use of money. Hence his proposal to pay his conscripts trade union wages. Lenin, in his early days, would have commandeered the labour without payment, thereby showing himself much more logical than Mr. Clarke.

Housing, however, is a serious matter; and the question is whether the problem it presents can be solved by private initiative, or whether it is going to follow the course of many other problems and be settled by the Socialist method of nationalization. This method has already been applied to education and to medical treatment; if it be true, as Mr. Clarke says, that it is impossible to build houses for the working classes which can be let at an economic rent, then some future Government may be compelled to take a further step in nationalization, and to add another to the State's unprofitable ventures in trading. And this notwithstanding Sir Alfred Mond's statement that the matter is one for local authorities.

There can be no doubt that the garden cities of Port Sunlight and Bournville are more pleasant to look upon than the horrible rows of miners' cottages which line a Welsh colliery valley. Is it possible in any way to encourage more firms, or possibly combinations of firms, to do what Lever Brothers, and Cadburys, and many more have done? Again, Mr. Clarke, in a spasm of anti-Socialist repentance, suggests that tenants should be urged to buy their houses. In this way he would limit the State's loss to the actual loss in building the houses. For the moment this system of selling to such tenants as are willing or able to purchase would postpone complete nationalization. But Mr. Clarke omits to note that, whether the State sells or whether it remains landlord as well as builder, the time will probably come when the houses will no longer be considered up to date, and will require reconstruction. This has happened already in the cases of cottages and buildings which, some forty to fifty years ago, were described as "model"; it will continue to happen until landlords have been educated up to establishing a reserve fund to meet the day when reconstruction becomes necessary. The absence of such a reserve fund in the case of landlords of the less wealthy type probably accounts for the continued existence of many of the slums.

Finally, is it permissible to suggest that too many comforts, which our forefathers regarded as luxuries, are now regarded as necessities? Is it true that every house requires a bathroom? Or is it not possible that those who cannot really afford this can be just as clean with a zinc bath? Or if modern baths are considered essential, has the cost of erecting a cheap bathing place—not an expensive Public Bath—for the use of an area, been compared with the cost of building a separate bathroom for each of several hundred houses? It seems to me possible that the standard of comfort has perhaps outrun our capacity to pay for it; and that we should aim at structures which, while passably efficient, shall be cheap and not too permanent.

I confess that I cannot contemplate with pleasure the day when the State will erect houses for all and sundry. Many of the Addison houses are not unpleasing in design, but they were extravagant. A Government short of cash will produce something worse than the worst of the miners' cottages.—I am, etc.,

London, W., Dec. 17th. CHAS. BUTTAR.

THE STANDARD OF FAT IN COW'S MILK.

SIR,—In your leading article which appeared on December 1st (p. 1054) on the above subject, you attribute to Mr. Wilfred Buckley, C.B.E., the following statement—namely, "That the percentage of butter fat in the mixed milk of shorthorn cows may be less than 3 per cent. in the morning, but in all probability not less than 3 per cent. in the evening, and that it will exceed 3 per cent. over a period of twenty-four hours." Surely, Sir, that statement requires qualifying as to the intervals between the milkings, which regulate the yield of fat; it is common knowledge that a herd of cows will yield less than 3 per cent. when the interval exceeds twelve hours, and the longer the interval the less the fat; for instance, the fat would probably be over 1 per cent. after fourteen and a half hours' interval, less than that after nine and a half hours. Another cause for a low percentage of butter fat is careless or incomplete milking, allowing a part or the whole of the strippings to remain; the amount of fat in the fore, middle, and strippings often varies from 2 to 8 per cent., so that any neglect in that direction would upset all calculations; on the other hand, if a herd of 65 healthy shorthorn cows is kept under normal conditions, and thoroughly milked and stripped at intervals not exceeding twelve hours, it is practically impossible to obtain less than 3 per cent of fat. It will be well to postpone judgement pending further light on the subject, which might be forthcoming from Mr. Buckley. In the meantime judges and magistrates need not hesitate to inflict penalties on those who trust to Mr. Buckley's conclusions as evidence of their honesty: my experience is that the milk supplied at our doors varies with the honesty of the purveyor.—I am, etc.,

T. D. HARRIES, F.R.C.S., M.R.C.P.

Aberystwyth, Dec. 16th.

POSTURE DURING DELIVERY.

SIR,—In his letter (October 27th, p. 785) Dr. Joy refers to Dr. Fairbairn's statement that the natural position of negroes during confinement is a squatting one. The Santals, too, have their confinements in a sitting posture. Their day of confinement is spoken of as their "sitting day." When I came here twenty-five years ago I thought it was probable that the women did have trouble during their confinements, but that this was not known owing to the fact that there was no woman doctor here for them to call in. I asked those living near our bungalow to let me know when labour began. Many of them did so. Though I arrived as a rule soon after getting the message I almost invariably found the mother sitting on the floor with the baby and the placenta beside her. On one occasion I arrived about an hour after the confinement was over and found that the mother had cleaned out her house after the birth of her baby.

The women here lead a healthy open-air life and keep their muscles in good condition by field work. For the Hindu women in the villages round about who are attended by "dais," confinement is a much more serious affair. Santal women are left entirely to Nature, and the results are excellent.—I am, etc.,

Bamdah, Santalia, Nov. 21st. J. R. MACPHAIL.

DIFFICULT MIDWIFERY IN GENERAL PRACTICE.

SIR,—Surely it is high time for lecturers and professors to appreciate the fact that the general practitioner has not been doing midwifery all these years without learning something. Chloroform has altered the whole orientation of the art of obstetrics. Nothing is exactly where it was. The textbooks are out of date. It is an anachronism, for instance, to write or speak of an unreduced occipito-posterior position. One does not think of it, far less tolerate it. And, speaking so, I imply reduction of the condition by neither the manual exercises described in lectures and books nor the "efforts . . . by means of abdominal pads" which appeal to one of your correspondents. Every device of that type provokes the conundrum of the profession, "It's pretty and scientific, but does it work?" and "the Devil . . . behind the leaves" is amused at us.

Only one method of reduction is worth the attention of practical men: application of forceps, rotation of the foetal head by these, and, without displacement of the blades, delivery. Objections raised against the method (that one may twist the infant's neck, that the forceps will slip,

that the opposed curves of instruments and passage invite trouble, etc.) are all hypothetical, visions which never materialize in practice. You anaesthetize your patient; slip the blades on in the recognized way, with the usual precautions and the usual endeavour to adjust them accurately to the sides of the head; then you lock the instrument and—do not pull but push—gently push the head back towards the uterus. Once it is free, you as gently turn the handles (just as you would rotate a key) through the half-turn or less necessary to carry the occiput forward. And then you act exactly as you would in any ordinary instrumental delivery: nothing more; nothing less. To loosen or withdraw the forceps with a view to an academical adjustment of their curve is unnecessary—you gain nothing in efficiency of control, and you risk what you have won.

After close on thirty years of professional experience, I know no manœuvre which, so simply, can confer an equal sense of quiet satisfaction. To have evaded the desperate pull, and dodged destiny, and got there all the same, is better than a bloody victory over circumstances—better even than a craniotomy!—I am, etc.,

Belfast, Dec. 9th. ROBERT WATSON.

HYPOGLYCAEMIA AND EPILEPSY.

SIR,—The possibility which has suggested itself to Dr. Mackay, in his letter which appeared in the JOURNAL of December 15th (p. 1184)—that it is the reduction of the blood sugar below a certain percentage that produces the epileptiform seizure—has, no doubt, occurred to many. The matter is being investigated in the Research Laboratories of the Cardiff Mental Hospital.

We are in a position to answer Dr. Mackay's first question, as far as it can be answered on the basis of the repeated examination of sixteen cases of genuine epilepsy. These patients, after tea—consisting of tea, bread, and margarine—on the evening before the blood was taken, received nothing further until 6.15 a.m. of the day upon which it was taken, when they were given an egg, two slices (about 6 oz.) of bread-and-butter, and water to drink. The blood was examined from three and a half to four hours after the above meal. There was no hypoglycaemia in the inter-fit periods; the blood sugar was within normal limits. In two of these cases the blood was withdrawn a few minutes before the fit.—I am, etc.,

Cardiff City Mental Hospital, Dec. 18th. EDWIN GOODALL.

SEROLOGICAL TESTS IN DIAGNOSIS.

SIR,—I have just read, with the greatest interest, Professor H. R. Dean's most able and learned paper in the BRITISH MEDICAL JOURNAL, December 1st (p. 1033), on the value of serological tests in diagnosis; it is only the extreme interest which I take in this subject that emboldens me to address you, and to ask for his advice and guidance regarding certain aspects which puzzle me.

In the first place, I gather that it is at least Professor Dean's own conviction that specific opsonin in tuberculous serums and the antibody which is responsible for a positive complement fixation reaction are of one and the same kind. Is not clinical experience rather opposed to this idea? Is not the opsonic index rather a measure of the host's defensive mechanism, and the complement fixation reaction quantitatively a measure of the host's susceptibility; in other words, both in tuberculosis and in syphilis, is not deviation of the complement possibly an anaphylactic phenomenon?

Excluding an occasional and individual exception, does not a lowering of the opsonic index curve travel *pari passu* with the patient's downward clinical progress; and does not this same downward clinical progress correspond in general with a gradual elevation in the number of minimal haemolytic doses deviated by the patient's serum?

Viewed from this angle, is it unreasonable to consider the substance responsible for the deviation of the complement to be, not an "antibody" at all, but a "pro-body," a sensibilizer? If so, the apparent paradox that the same serum should predicate infection, by a surplus in the one reaction and by a deficiency in the other, becomes at least explicable. Again, is it not possible that both should coexist in the same serum, and maintain a kind of equilibrium? Let something arise to disturb this equilibrium, and the result will be either complete cure (clinical and serological) or a recrudescence of clinical disease. It seems to me that this hypothesis might explain how a man may enjoy for years perfect health with a strongly positive Wassermann reaction—even to the end of his days, and even beget healthy children, and may yet again develop neural syphilis or a gumma at any moment.—I am, etc.,

Chelsfield Station, Kent, Dec. 3rd. J. GRAHAM WILLMORE.

Obituary.

JAMES GRANT ANDREW, M.B., C.M.GLAS., F.R.F.P.S.G.,

Consulting Surgeon, Victoria Infirmary, Glasgow.

THE death of Mr. Grant Andrew took place with tragic suddenness on December 6th. He was present at a medical dinner in Bournemouth on that evening, and after delivering a recitation he resumed his seat and expired almost immediately. Though his immediate relatives were aware of the existence of a cardiac disability for which he sought advice only recently, his death, and the manner of it, came as a great shock.

He was a son of the manse, and was born at Busby, near Glasgow, in 1868, where his father, the Rev. Alexander Andrew, D.D., was at that time minister. His education was obtained at Hutcheson's Grammar School, Glasgow, from which he entered on the study of medicine at Glasgow University. He was a steady worker, and gained several distinctions, being during his last year medallist in the senior class of surgery. He graduated M.B., C.M. in 1889, and obtained the post of resident assistant in the Victoria Infirmary, where he remained for a year, before proceeding to Dublin, London, and Paris for further experience. On his return to Glasgow he was demonstrator of anatomy in the Anderson College for a time, and later assistant to the professor of surgery. In 1892 he returned to the staff of the Victoria Infirmary as surgeon to out-patients; later he became assistant surgeon, and in 1905 he was promoted to be surgeon in charge of wards. He held this post, and discharged its duties with much acceptance and success, till about two years ago, when, though he had not reached the age limit, he retired. To use his own words, he felt that he would like to pass the remainder of his allotted span under more congenial skies, and he chose Bournemouth. Since then he had practised there as a consulting surgeon. He was a member of the Medical Pensions Board at Southampton, and served on the Council of the Scottish Graduates and Medical Schools Club of Hampshire and Dorset. On leaving Glasgow he was appointed honorary consulting surgeon to the Victoria Infirmary.

During his surgical career in Glasgow Mr. Andrew found time to undertake a good deal of extra work. Particularly would we mention his excellent record in connexion with the affairs of the British Medical Association. He was a member of its Central Council from 1908 to 1913, and during that period did admirable work on various important committees—the Medico-political, Medical Inspection and Treatment of School Children, and the Scottish. He was also a member of the Glasgow Branch Council, and was chairman of the Glasgow Central Division from 1917 to 1919. His work and activities in Association matters were to him a source of real pleasure, as he had its best interests and those of his profession at heart.

He was for many years a member of Glasgow School Board, and later of the Education Authority, and did excellent work particularly in connexion with matters relating to the medical inspection of school children, and the establishment of treatment centres in various parts of the city. He was a regular attendant at meetings of medical societies, and frequently contributed to their proceedings. In the Southern Medical Society of Glasgow he served in almost every office, and was its honorary president for the present session. Indeed, he only delivered his address in this capacity on October 4th last; this paper, on "Molière and the Doctors," was published in the *Glasgow Medical Journal* for November.

When the Territorial Army was formed in 1908, Mr. Grant Andrew was attached to the 4th Scottish General Hospital with the rank of major *à la suite*. On the outbreak of war in 1914 he was mobilized with his unit and served at Stobhill during the war years, except for a period of six months in which he did good work as divisional surgeon with the 58th General Hospital in France. After demobilization he was appointed surgeon to the Bellahouston War Hospital under the Ministry of Pensions.

From time to time he made many contributions to surgical literature, but in particular we may cite two publications—*An Investigation into the Treatment of Tubercular Disease of the Hip-joint—a Critical Examination of Seventy Cases* in 1901, and *The Age Incidence of Disease* in 1909.

His was a cheerful and genial personality. He always looked on the bright side of things, and his optimistic outlook carried him over many difficulties, and gained for him many friends in Glasgow, who mourn his loss. He is survived by his widow—a daughter of the late Mr. Crerar Gilbert of Yorkhill, Glasgow—one son, and two daughters.

SYDNEY STEPHENSON, M.B., C.M., F.R.C.S.EDIN.,
Consulting Ophthalmic Surgeon, Queen's Hospital for Children.

WE regret to announce the death of Mr. Sydney Stephenson, which took place on December 15th after a long period of ill health and bodily weakness. He was an ophthalmic surgeon of world-wide repute, particularly as founder and editor of the *Ophthalmoscope*, a monthly review which he established in 1903. At that time there were in existence two reviews which had been published for some years, and the advent of a new review was looked upon as more than an uncertain speculation. But Mr. Stephenson had a real flair for journalism, so that his review speedily made its mark as a progressive and valuable organ. He made a specialty of combined reviews upon some subject of topical interest, securing good contributions from many writers on these subjects, together with succinct reports of papers by writers in foreign reviews. What he accomplished in this way for other workers in the field of ophthalmology was of real service to the specialty and will not be forgotten. By 1913 the review he edited had become by far the most important periodical of British ophthalmology, and at that date, through a movement initiated and carried through by the energy of the late Mr. Walter Jessop, the three British periodicals—the *Ophthalmoscope*, the *Ophthalmic Review*, and the *Royal London Ophthalmic Hospital Reports*—were combined into one periodical, the *Journal of British Ophthalmology*. The venture was secured financially by a small limited company, and the editorship of the new journal remained in the competent hands of Mr. Stephenson, an office which he continued, despite his severe physical disabilities, until his lamented death. The combination proved a real success, the journal adding to the dignity of British medicine in no small measure; and by good management the company has been a success also.

There was much else besides journalistic work in which Mr. Stephenson made his mark. He was at one time the ophthalmic surgeon of Queen Charlotte's Hospital, and through that office gained much insight into the conditions of ophthalmia neonatorum. When in 1908 the British Medical Association appointed a special committee to consider the causes and means of prevention of this fell disease he was chosen chairman of the committee; its report, which was largely the work of Mr. Stephenson, became a classic on the subject, and a basis for much of the propaganda which has so materially reduced the incidence of the disease in recent years. Associated with this work was his success as Middlemore Prize essayist of the British Medical Association in 1907; his essay, published in a book entitled *Ophthalmia Neonatorum*, was a veritable encyclopaedia of knowledge, leaving little else for anyone to add at that time.

For a time Mr. Stephenson was a medical officer of the Poor Law ophthalmia schools at Hounslow and did valuable work in that capacity, presenting a parliamentary paper on the "Ophthalmic State of the Poor Law Children in the Metropolis." His interest in the study of disease in children led him in association with the late Dr. Carpenter to found a society for that special study. The effort attained an immediate success, and when the amalgamation of many societies resulted in the formation of the Royal Society of Medicine the society became, and still is, one of the constituent sections. He was a great friend of the late Mr. R. Doyne, who had a close connexion with Oxford. Between them they founded the Oxford Ophthalmological Congress, which meets yearly in Oxford. From the beginning its pleasant air of good fellowship gave it a strong appeal, particularly to provincial members of the specialty, so that it was to be expected that on the death of the first Master of the Congress, Mr. Doyne, he should be succeeded by Mr. Stephenson. There will be many members of that Congress who will regret the loss of its second Master. The papers and books published by Mr. Stephenson are too numerous to name, but there are few of them which have been without some influence upon his compeers and the generation which succeeds them.

He went to school at Epsom College, was a graduate in medicine of Edinburgh University, and a Fellow of the Royal College of Surgeons of Edinburgh. He leaves a wife and one daughter, to whom we offer our sympathy.

Dr. EDOUARD MEYER, dean of the Nancy Faculty of Medicine, has recently died at the age of 63.

The Services.

VOLUNTARY AID DETACHMENTS.

New Organization.

THE Army Council has approved a scheme under which, in the event of war or other national emergency, the medical services of the Navy, the Army, and the Air Force will be supplemented by the personnel of voluntary aid detachments. These detachments will furnish the recruits for motor ambulance convoys and ambulance trains, hospitals and hospital ships, rest stations, convalescent homes, and other requirements for the sick and wounded. Detachments must be registered at the War Office through the Joint Voluntary Aid Detachment Council. Existing detachments need not be re-registered, but all members of such detachments will be re-enrolled. Detachments will be recruited and organized on a county basis, and will be administered by county controllers appointed by the Territorial Associations.

The personnel of detachments will comprise a mobile and immobile class. The mobile members of men's detachments will be between the ages of 19 and 40, and of women's detachments between 21 and 40. They must be prepared to undertake service on mobilization either at home or abroad, while immobile members, both men and women, who must not be under 18 years of age, will serve within reach of their homes. Men of military age, enrolled in any of the detachments, will not be held to be exempt from military service in accordance with any Military Service Act that may be in force. Candidates for appointment in the men's detachments, unless qualified as pharmacists or by previous experience in the medical services, must be in possession of a first aid certificate, and similarly women, with the exception of trained nurses, pharmacists, qualified dispensers, and hospital cooks, must have taken the certificates in first aid and home nursing.

The Territorial Army Associations will be responsible for the enrolment and efficiency of the various detachments, acting in close co-operation with joint county committees, and those who will train the personnel in their respective areas. A Central Joint Voluntary Aid Detachment Council—consisting of representatives of the Admiralty, War Office, the Air Ministry, Territorial Army Association, the Order of St. John, the British Red Cross Society, and the St. Andrew's Ambulance Association—will have full administrative and executive powers within the limits of the scheme. Lieutenant-Colonel W. H. A. De la Pryme has been appointed secretary of the Council, and the offices of the Council will be in 80, Pall Mall, London, S.W.1.

The fourth annual dinner of the 4th Northern General Hospital was held in Lincoln on December 13th, 1923, with Lieutenant-Colonel Lambert in the chair. It was decided that in future the dinner should be held annually in the spring and that invitations should be extended to all medical officers who had served in the Navy, Army, and Air Force, and who lived in the vicinity of Lincoln, as well as to the quartermasters and chaplains who had served in the 4th Northern General Hospital. Hospitality will be provided for any officers who attend the dinner, and who live out of Lincoln. The next dinner will be held in April, 1925, under the presidency of Colonel A. M. Connell, A.M.S., T.D.

The annual dinner of the 14th Stationary Hospital was held at the Trocadero Restaurant, London, on December 14th, under the presidency of Lieutenant-Colonel J. R. Harper. The next dinner will be held on the second Friday in December, 1924.

Universities and Colleges.

UNIVERSITY OF OXFORD.

THE following candidates passed the Final Examination for the degrees of B.M., B.Ch. in the subjects named:

Forensic Medicine and Public Health: G. R. P. Aldred-Brown, W. H. Bradley, R. E. D. Cargill, A. D. Dyson, C. L. Elgood, D. R. Gawler, C. A. H. Green, L. N. Jackson, W. J. E. Lupton, H. A. Robertson, V. P. Robinson, B. G. Scholefield, I. M. Sidley, B. E. Thompson, G. I. Wilson, A. E. B. Harding. *Medicine, Surgery, Midwifery:* O. D. Ballinger, D. T. Barnes, A. M. Cooke, R. S. Creed, L. N. Jackson, J. A. Macfadyen, G. F. L. Mitcheson, H. A. Robertson, B. G. Scholefield, E. B. Strauss, T. S. Townsend, H. F. Turney, A. E. B. Harding, J. Orr-Ewing. *Materia Medica and Pharmacology:* C. P. Blacker, W. H. Bradley, H. A. Byworth, J. N. C. Ford, A. T. Fripp, A. H. Gale, C. L. Harding, G. G. Hill, H. O. Hopkins, T. C. Hunt, J. S. Jerome, M. J. W. Minshull, J. S. Rake, C. E. Roberts, J. de la Mare Savage, J. G. S. Thomas, O. R. Tisdall, A. L. Wilkinson, K. G. Norton, J. M. Vaughan. *Pathology:* L. J. Barford, C. P. Blacker, R. B. Bourdillon, W. H. Bradley, C. S. Broadbent, R. V. Facey, L. N. Jackson, T. L. Ormerod, R. A. Walsh, O. B. Buckley, E. J. Cockram.

In a congregation held on December 15th the following degrees were conferred:

D.M.—M. E. Shaw.

B.M., B.CH.—O. D. Ballinger, D. T. Barnes, A. M. Cooke, R. S. Creed, Alice E. Harding, L. N. Jackson, J. A. Macfadyen, G. F. L. Mitcheson, T. L. Ormerod, T. S. Townsend, H. F. Turney.

UNIVERSITY OF LONDON.

UNIVERSITY COLLEGE.

Scholarships 1924.

SIX scholarships and exhibitions are available for students of the Faculty of Medical Sciences entering the College in October, 1924. The value of these scholarships and exhibitions is not less than £40 a year each, tenable in some cases for three years and, in the case of the Bucknill Scholarship, for the whole period of medical education. The value of any of these scholarships or exhibitions may be increased by the grant of a supplementary bursary if the circumstances of the scholar or exhibitioner make such a grant necessary.

UNIVERSITY OF LIVERPOOL.

THE following candidates have been approved in the examinations indicated:

M.D.—J. Flanagan, Annie A. Muir.

FINAL M.B., CH.B.—*B. Ordman. *Part III:* R. L. Blair, I. Casdan, M. Cohen, N. B. Cooke, J. C. Drummond, Kathleen Edgecombe, C. K. D. Edwards, D. Flenley, E. J. Foley, S. C. Goldstone, A. B. Griffiths, R. C. Gubbins, A. J. Hawe, C. W. Healey, F. H. Jones, W. F. Jones, A. Kefalas, T. S. King, Ruth Lunt, G. H. Mann, J. I. Noble, D. U. Owen, Eleanor M. P. Pearson, R. A. Roberts, G. Saunders, J. R. A. Tallack, Elizabeth M. Theron, J. G. Thomas, R. W. Thomas, H. Walker, A. E. Wall. *Part I:* †A. T. Ashcroft, †C. A. Birch, J. M. Brodrick, N. Cresswell, H. L. Cullen, P. V. Dillon, L. Earlam, Sybil O. Edwards, W. Emdin, C. J. S. Garton, I. Gordon, A. J. Goss, Frances M. Greenhalgh, Catherine E. I. Greenshields, Gwyneth Griffith, C. A. Harris, Beryl M. Hawthorn, J. C. Heal, R. E. Horsfall, F. Hughes, Elvy I. Johnstone, S. M. Katz, B. D. Knoblauch, B. Krikler, Sarah Leigh, L. J. A. Loewenthal, T. R. E. Longton, †G. McNichol, E. Martinez, K. N. Mawson, J. Morrissey, Winifred A. Nicholson, G. W. Paton, H. Peaston, J. W. Reid, Kathleen M. Roberts-Dunn, †Miriam Roskin, J. C. Ross, F. B. Shevlin, Ruth Simpson, Margaret E. Thomas, R. S. Turner, C. E. Unsworth, J. Unsworth, Rosalind Vacher, F. W. Yates. *Part II:* C. P. Allen, A. Ashworth, C. Baxter, T. Bellis, D. Cohen, H. A. Cole, E. Cook, J. D. Craig, O. Dawood, H. Duff, J. H. Gilchrist, L. F. Henry, T. S. L. Jones, Rebecca Katz, A. L. Kerr, B. D. Knoblauch, B. Krikler, E. Martinez, J. R. Mitchell, R. S. Turner.

D.T.M.—B. Abelman, Winifred M. Edghill, N. D. Fraser, R. Lee, E. R. Peirce, C. B. B. Reid, A. E. Richmond, J. B. Steven.

* With second-class honours and distinction in Surgery.
† Distinction in Pathology.

UNIVERSITY OF BIRMINGHAM.

AT the congregation held on December 14th the following degrees were conferred:

CH.M.—H. P. Pickerill (*in absentia*).

M.B., CH.B.—A. Beauchamp, W. E. Bardie-Adshead, W. L. Blakemore, O. Bresner, Annie Bryce, M. Cohen, Vera Cullwick, G. Dudley, C. C. W. Maguire, W. H. Marston, C. J. Murphy, May I. Wallace, E. G. Wilkinson, R. C. Williams.

UNIVERSITY OF SHEFFIELD.

THE following appointments have been made: *Lecturer in Radiology:* R. A. Morrell, M.R.C.S. *Lecturer in the History of Medicine:* G. Wilkinson, M.B., F.R.C.S. *Lecturer on Operative Dental Surgery:* Mr. J. H. Skerritt. *Assistant Lecturer in Medicine:* D. C. Barron, M.D.

UNIVERSITY OF EDINBURGH.

AT the graduation ceremonial held in the M'Ewan Hall on December 14th the following degrees were conferred:

M.D.—*R. C. Begg, R. M'D. Cairns, Ethel Cassie (*née* Wiseman), †A. Dower, F. E. Gunter, D.S.O. (Lieut.-Colonel R.A.M.C.), W. T. Hall, A. Joe, I. H. Lipetz, A. M'Farlane, *D. A. Miller, D. H. Russell, *C. W. Stump.

DOCTOR OF PHILOSOPHY (*in the Faculty of Medicine*).—H. Dryerre.

M.B., CH.B.—J. B. Adamson, H. Allan, F. Allardice, I. R. Anderson, D. Arnott, J. N. Banks, D. M. Bertram, C. C. Boudou, E. R. Boyd, J. Braithwaite, Jessie S. Brash, E. H. Brindle, J. C. R. Buchanan, A. Bury, J. M. Caie, Margaret D. Cairns, Kathleen S. Campbell, R. F. Campbell, J. T. D. Clark, J. L. Connacher, J. G. Cormack, J. W. Cromarty, E. G. Dalziel, ‡A. W. Davidson, J. Davidson, J. P. Davie, H. A. N. Dippenaar, W. G. Dobson, Isabel M. A. Doeg, L. G. Drury, R. H. Dunlop, L. M. C. Duthie, R. W. Easton, Margaret G. Falla, W. Foote, W. M. Ford-Robertson, W. M. Forster, W. C. Fothergill, D. A. Fraser, J. F. Fraser, E. M. R. Fraser, L. S. Frost, M. Gelb, G. M'K. Gibson, S. Gill, A. Gillies, A. C. Gillies, D. Gold, Margaret H. Gordon, A. D. Gould, R. W. Graham, Yooll, L. P. Greson, A. B. Guild, W. F. Hamilton, H. C. Hanham-Fox, L. E. Henderson, C. V. Hendry, H. Hoffman, E. G. Hunter, L. Jaffit, E. W. C. Jobson, W. Jones, M. Kahn, Isabella Kerr, Annie C. King, W. H. Kluge, Annie G. Learmonth, J. G. Leebody, A. Leishman, R. V. Liddell, Elizabeth M. Lindsay, R. Lockhart, G. Louw, D. B. Low, R. I. M'Alley, W. N. M'Arthur, J. Maccabe, G. H. M'Cafferty, S. J. M'Cafferty, A. W. M'Cay, P. A. M'Crae, D. Macdonald, J. D. Macdonald, R. Macfiggans, Jane C. M'George, Janet M'L. Mackay, ‡D. T. Mackie, J. B. Mackie, Catherine J. Maclaren, I. H. Maclean, S. R. Macmillan, D. A. B. Macnicol, G. S. Marr, E. B. Mercer, H. Miller, J. Milne, G. W. Monro, J. V. Nelson, A. S. Nicol, J. T. B. Nicoll, B. R. Nisbet, G. Ormiston, Violet Owen, J. R. H. Pasqual, D. G. Paterson, W. D. Paterson, I. A. M. Paton, M. Pretovitch, W. J. R. Pickles, R. K. Porteous, G. Priestman, P. V. Pritchard, W. H. B. Ramsay, W. Ramsay, Jeanne V. Rees, R. E. B. Rees, J. J. Robb, G. Robson, A. Rosenbloom, R. J. Ross, Margaret G. Ross, H. L. Rubin, C. G. A. Salvesen, R. E. W. Sandeman, A. Scott, M.C., Jocelyn M. S. Scovell, J. A. Shaw, A. Simpson, G. W. Simpson, Ann F. G. Smith, C. R. Smuts, N. R. Smuts, W. R. Sprunt, J. P. Stewart, F. M. Stuart, T. R. M. M. Sutherland, W. R. Terry, F. F. du Toit, T. S. Torrance, F. Towers, Elsie M. Walker, E. D. M. Wallace, H. K. Watson, J. H. Watson, F. H. Webb, A. R. Williamson, Winifred Wood, G. W. Yule.

The Ellis Prize in Physiology has been awarded to Dr. May Laura Walker.

* Awarded gold medal for thesis.
† Commended for thesis.
‡ Passed with second class honours.

UNIVERSITY OF DUBLIN.

SCHOOL OF PHYSIC, TRINITY COLLEGE.

THE following candidates have been approved at the examinations indicated:

FINAL EXAMINATIONS, PART II.—*Medicine:* *W. A. Taylor, P. K. Dixon, J. E. Eliason, J. M. Mounsey, H. Isaacson, I. Marin, J. A. du Toit, E. R. Hafner, J. A. Levitt, J. S. Glasgow, W. L. W. Smith, R. F. Fausset, W. F. Whaley, D. L. Hemmingway, Gladys Weatherill, Kathleen E. Hill, A. J. Beckett, J. M'Clelland, F. C. B. L. R. Crawford, C. W. J. Ingham, W. D. Speedy, D. H. F. Milmo, J. V. Williams, P. C. du Plessis, A. B. Monks, A. V. Wood, Margaret O'Neil. *Surgery:* P. K. Dixon, G. F. T. Saunders, R. L. C. Fisher, M. Cohen, N. E. H. P. Williams, W. L. W. Smith, J. L. Stuart, J. J. Laing, J. E. Deale, C. J. M'Quillan, J. M'Clelland, H. W. L. Dale, L. Harris, Martha Reid, R. Schaffer, C. W. J. Ingham, J. J. O'Grady, F. G. Brown, J. M. Gordon, Isobel G. Smith, J. H. Stals, P. P. van der Merwe, Kathleen E. Hill, J. A. MacDonald, E. Isaacson, H. J. Hugo, Isabella H. Speedy, Eileen A. Boyd, J. A. du Toit. *Midwifery:* *D. K. Lyons, *J. K. S. Thompson, *O. G. Wilde, *G. A. Cowan, *J. R. Bradshaw, *G. Robinson, L. C. Brough, J. S. Armstrong, S. Wigoder, L. E. J. Werner, J. A. MacDonnell, J. N. Atkinson, J. H. Bowyer, W. H. Anderson, R. E. Steen, Dorothy J. Booth, F. J. Swanepoel, J. W. Wallace, L. S. Levitt, C. J. M. Loubser, K. F. MacKenzie, L. M. Whitsitt, J. L. Marshall, J. Morris, J. L. F. Steele, J. Horwich, W. A. Dickson, C. J. du Plessis, G. W. Garde, R. Warnock, J. D. Watson, W. A. Redmond, Eileen Brangan, Norah M. Gilcriest, P. N. H. Labuschagne, R. L. G. Proctor, I. Strasburg, H. Birney, A. L. Dobbyn, R. J. G. Hyde, Bertha H. Lawler, P. D. Pirl, H. W. Strong, Nancy E. R. Pigott, Dorothy I. Henry, H. St. G. McKenny, R. G. F. Thompson, G. D. Rankin, R. A. Webner, R. W. Harte, L. P. Sayers, Angel V. B. Crawford.

* Passed on high marks.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary meeting of the Council was held on December 13th, when Sir John Bland-Sutton, President, was in the chair. The deaths of Sir Frederick Treves and Mr. William Harrison Cripps were reported, and votes of condolence with their relatives were passed. Diplomas of Fellowship were granted to the following twenty-five candidates:

Hugh Braund Kent, Granville Douglas Robertson, Leonard Graham Brown, Hugh James McCurrich, Thomas Collyer Summers, Douglas John Batteham, Salomon Kadinsky, John Miles Bickerton, Norman August Marras Petersen, Harold Currie Brayshaw, William David Doherty, William George Rose, Reginald Walter Patrick Hosford, Clement Price Thomas, Thomas Stanley North, Lionel Richard Fifield, William Collins Fault, William Eric Marcus Mitchell, Calvert Mitchell Carruthers, William David Hart, Michael Vincent Hurley, John Robert Lee, Saurendra Mohan Majumdar, Dallas Bradlaugh Walker, Owen Herbert Williams.

Licences in Dental Surgery were granted to 119 candidates. King's College Hospital Dental Department was added to the list of dental schools recognized for the course of study for the Licence in Dental Surgery.

Mr. V. Warren-Low was re-elected a Member of the Court of Examiners. Mr. W. G. Spencer was re-elected a Member of the Central Council for District Nursing in London. Sir Berkeley Moynihan was re-elected a Member of the Court of the University of Birmingham.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

AT the annual meeting of the Royal College of Physicians of Edinburgh held on December 6th the following office-bearers were elected for the ensuing year:—*President:* Dr. G. Lovell Gulland, C.M.G. *Vice-President:* Dr. J. C. Dunlop. *Treasurer:* Sir Norman Walker. *Honorary Librarian:* Dr. Robert Thin. *Curator of the Research Laboratory:* Sir Robert Philip. *Secretary:* Dr. J. A. Fowler. *Members of Council:* Sir Robert Philip, Dr. J. C. Dunlop, Dr. R. A. Fleming, Dr. Robert Thin, Dr. Lamond Lackie, and Dr. Edwin Matthew. *Representatives on the Board of Management of the Royal Infirmary:* Dr. J. C. Dunlop and Dr. Claude B. Ker.

LONDON SCHOOL OF TROPICAL MEDICINE.

The following candidates have passed the examination of this school at the termination of the seventy-third session (September to December, 1923):

*†A. D. Wright (Malaya Medical Service), *N. D. Dunscombe, *H. B. Lee (West African Medical Service), *P. S. Mills (I.M.S.), *G. R. McRobert (I.M.S.), M. J. Graham, T. S. Tirumurti, Y. A. Barrada, Miss H. S. Watters, D. G. Garnett, M. G. Bhandari (I.M.S.), A. A. Hearne, C. L. Wilmoth, W. L. Paterson, W. K. Dunscombe, T. Seethapathy, R. M. Kharegat (I.M.S.), L. Anigstein, J. H. Neill, P. N. Basu (I.M.S.), J. J. Moriarty, J. Findlay (I.M.S.), D. R. Hennessy, J. S. Bellas, H. C. Van Dort, W. E. McCulloch, F. H. Ccoke, Miss J. V. Dhurandhar, A. E. Coyne, J. L. Kapoor, Hari Das (I.M.S.), K. Lindberg, R. P. Perera, Miss Y. Sen, A. Kassem, A. H. Shaikh (I.M.S.), C. H. Philips, J. R. Forde, C. J. Austin, H. L. Burke, D. T. Skeen, Lieut.-Colonel C. Bramhall (R.A.M.C., ret.).

*With distinction. †Awarded the Duncan Medal.

Medical News.

THE King has become patron of the Royal Society of Tropical Medicine and Hygiene, which has been a royal society since his command in 1920. The society was founded in 1907 to unite and facilitate intercourse and propagate knowledge among medical men and scientific investigators in all parts of the tropical world. The society has had a distinguished list of presidents: Sir Patrick Manson, Sir Ronald Ross, Sir William Leishman, Sir Havelock Charles, Dr. F. M. Sandwith, Sir David Bruce, Sir William Simpson, Sir James Cantlie, and Sir Percy Bassett-Smith (who now holds office).

A SCIENTIFIC conversazione, which was honoured by the presence of the Prince of Wales and a distinguished company numbering more than a thousand, was held at the Middlesex Hospital and its medical school on the evening of December 18th. The operating theatres and the electrical department were open to the visitors, as was the radiological department, which comprises three rooms—one devoted to x-ray diagnosis and the others to superficial and deep x-ray treatment. There was also a radium exhibition, and demonstrations of ultra-violet rays were given. Many demonstrations were also given in the bacteriological, physiological, and histological departments, and in other rooms the method of preparing insulin was illustrated.

WE understand that Sir Frederick Mott will continue to direct the course of lectures for the Diploma in Psychological Medicine at the Maudsley Hospital, and that the seventh course will commence on Monday, January 21st, 1924, when he will begin the delivery of a course of eight lectures on the anatomy of the nervous system. The physiology of the nervous system will be treated by Dr. F. Golla in a like series, beginning on January 25th. The lectures on psychology will be given by Dr. Henry Devine, the first on January 24th. Full particulars of the course can be obtained from the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E.5.

THE next course of lectures and practical instruction for the diploma in psychological medicine granted by the various universities will be held at Bethlem Royal Hospital, S.E.1, and commence on Monday, January 14th, 1924. It will last for three months and consist of two parts: (A) anatomy, histology, and physiology of the nervous system, also general psychology; (B) neurology and psychological medicine. The fee for the whole course is 15 guineas, and the fee for Part A or Part B separately is 10 guineas. The time table of the course can be obtained from the physician superintendent at the hospital. Clinical instruction in psychological medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11. The fee for post-graduates is 5 guineas for three months' attendance, but a reduction is made to those who attend the course for the diploma in psychological medicine.

THE usual series of post-graduate courses, covering practically all the departments of medicine, will be given during the first quarter of 1924 in Vienna. A special refresher course will begin on February 24th. Particulars can be obtained from Dr. Kronfeld, Porzellangasse 22, Vienna IX. Copies of the programmes can be obtained by members in the Library of the British Medical Association.

A DISTRIBUTION meeting of the President (H.R.H. the Prince of Wales) and Council of King Edward's Hospital Fund for London was held on December 18th, when grants to the amount of £235,000 were made to hospitals and convalescent homes. Owing to pressure upon our space the account of the meeting is held over until our next issue.

THE forty-second annual dinner of the Old Epsomian Club was held at the Trocadero Restaurant, London, on December 13th, with the president, Mr. W. Æneas Mackay, in the chair. In proposing "Floreat Epsomia" Mr. Mackay said that a project which had been in his mind for some time was the setting up of a hostel in London for old boys of the school, where they could live while studying for medicine and other professions; it would serve also as headquarters for the club. He coupled with the toast the name of Mr. A. C. Powell, headmaster of Epsom, whom he welcomed as the first man of science to hold that office. At the end of his speech the school song, *Canticum Epsomiense*, was sung with enthusiasm. Mr. Powell gave an account of the past year's successes in work and play, and in so doing remarked that the real function of a first-grade public school was to turn out men worthy of the British Empire, not merely members of one specialized calling. He was able to announce that the work of building the school chapel, which is to form the Epsomian War Memorial, was progressing steadily. The honorary secretary of the club, Mr. S. Maynard Smith, C.B., F.R.C.S., briefly reported the receipt of messages of regretful absence from old Epsomians in many parts of the world—"from Birmingham to Burma." The health of the visitors was proposed in a witty speech by Dr. P. Montague Smith, whose thumbnail biographies of the principal guests were greatly relished. In responding, Mr. E. W. Garrett, for many years a metropolitan police magistrate, expressed the appreciation of his fellow residents for the new headmaster's friendly attitude towards the town of Epsom. A pleasant evening concluded with the toast of "The Chairman," proposed by Sir Thomas Wilson, Clerk of the Peace for Glasgow.

THE Ministry of Health has issued a table (Memo. 87/T) showing under various headings the weekly cost per patient in the year ending March 31st, 1923, at a large number of residential institutions for the treatment of tuberculosis, under the control of county councils and various local or private authorities. These headings include drugs, food, fuel and light, and staff expenses. Money may be saved by purchase through a central contract department. The inclusion in one contract of several institutions in the same locality is suggested. Economies in heating and lighting are often possible, and devices for making use of exhaust steam and a lower grade of fuel or ensuring a more complete degree of combustion may be adopted by the engineer in charge if he is supplied with information enabling him to judge the cost and efficiency of his department and encourage him to put forward better and more economical methods. It is hoped to publish the table in future years at an earlier date than December, if the returns from the various institutions are sent in more promptly.

LADY GEORGE NEVILL on December 13th opened the new orthopaedic and x-ray department which has been added to the Royal Sussex County Hospital, Brighton, as the result of a combined effort by the Joint War Committee of the Order of St. John of Jerusalem and the British Red Cross Society, the Shoreham United Services Funds, the Whellock and Blandford memorial funds, and private generosity. Lady Nevill's interest in the hospital has been demonstrated in the past by her gift of the greater part of the equipment of the massage department, and it was further announced during the ceremony that a cardiograph department, in memory of the late Lord George Nevill, would be presented and endowed out of money belonging to the Lady George Nevill Hospital in Hove, which was now closed. The new departments and the wards in connexion with them are most conveniently arranged, and the apparatus and equipment generally are of the most modern type.

MRS. HORBOROW, widow of Dr. A. E. R. Horborow, who lost his life at Weston-super-Mare in endeavouring to rescue two schoolgirls from drowning in a rough sea, has received from the Carnegie Hero Trust Fund a framed memorial certificate bearing the following inscription: "In recognition of the heroism of Albert E. R. Horborow, M.B., F.R.C.S., who died on 18th August, 1923, as the result of an effort to save life."

THE Lord Mayor, in presiding at the sixty-first annual meeting of the Royal Surgical Aid Society on December 12th, said since its existence the society had supplied 1,149,229 surgical appliances amongst 748,211 patients. It was almost impossible to realize the degree of comfort, independence, and relief which such figures indicated. In the past year 30,420 appliances had been supplied, in addition to the temporary loan of air and water beds, invalid chairs, crutches, etc. There were, he said, eighteen branches of the society in the provinces, and the work was auxiliary and supplementary to that of the hospitals, whose treatment frequently needed to be followed by the use of artificial limbs and other appliances. The society, which was under the patronage of the King and Queen, Queen Alexandra, the Prince of Wales, and other members of the Royal Family, was worthy of the heartiest support of the public.

MR. JOCELYN PATTERSON, M.Sc., Ph.D., of the University of St. Andrews, has been appointed biochemist to the Charing Cross Hospital Institute of Pathology.

THE first Friday evening discourse of the Royal Institution of Great Britain of the new session will be given on January 18th, 1924, by Professor H. E. Armstrong, F.R.S., who will discuss the scientific work of Sir James Dewar. On January 25th Sir Aston Webb, President of the Royal Academy, will speak on the future development of London, and on February 22nd a discourse will be given by Professor G. Elliot Smith, F.R.S., on the human brain. On Tuesdays, January 15th and 22nd, Dr. W. E. Dixon, F.R.S., of Cambridge, will give two lectures on drug addictions, and in February and March Mr. Joseph Barcroft, F.R.S., the new Fullerian Professor of Physiology, will give a course of four lectures on the respiratory pigments in animal life and their significance.

A SCIENTIFIC Novelties Exhibition, under the auspices of King Edward's Hospital Fund for London, will be held at King's College, Strand, daily from December 29th to January 9th, 1924. There will be demonstrations and experiments from 2 to 5 and 6 to 9 p.m.

A JAPANESE merchant, Yasukichi Miyagawa, was charged at the Central Criminal Court, on December 12th, with procuring 500 lb. of morphine hydrochloride to be sent to Japan, and also with possessing a quantity of the drug. The Recorder, in sentencing the prisoner to three years' penal servitude, said he would be recommended for deportation and would have to pay all the expenses of the prosecution.

THE *Paris médical* of December 15th reports that Dr. Soret, director of the Radiographical Section of the Pasteur Hospital in Havre for the last thirty years, has been obliged to have his right hand amputated in consequence of *x*-ray dermatitis. His forefinger was removed last March, but without bringing the disease to an end.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra Westrand, London*: telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

"S. W. T." asks whether it would be prudent to allow a small infant now a month old, weighing about 5 lb. (probably premature) to be taken out in an ordinary perambulator. The infant takes the breast freely and is doing well.

BUNGALOW HOSPITAL.

"H. R. G." asks whether any hospital has been built recently on the bungalow system—that is, with the wards all on the ground floor after the style of the hospitals erected during the war.

INCOME TAX.

Cash Basis—"Specific Cause" Claim.

"W. S. W." is a partner in a firm assessed to income tax on a cash basis of the three previous years. A new partner was recently admitted, and the new firm has lodged a claim to reduce the assessment to the amount of the cash profit of the first year, on the ground that the profits have fallen short owing to a specific cause following on the succession to the old firm. The inspector of taxes refuses to accept the cash basis for such a purpose.

*** The point raised is of some importance. There is no *legal* claim to the cash basis, which is accepted by the authorities on the ground that in the long run cash profits must approximate to true profits and are much more easily calculated. It will be seen that where, as in the case of a "specific cause" claim, special weight is attached to the profits of a particular year the "long run" argument is *pro tanto* not applicable, and equitable considerations call for a computation of the true profit for that purpose. Against this may be urged that during the war—under the special reliefs then in force—reductions from the average to the actual profit were dealt with on the "cash basis" on which they were put forward. In the circumstances we cannot advise our correspondent to press for a cash basis adjustment, but he will no doubt bear in mind the fact that even on the strictly legal calculation of the particular year's profit he can claim to deduct a properly calculated allowance for bad debts.

LETTERS, NOTES, ETC.

MENTAL AFTER-CARE.

The Mental After-Care Association for poor persons convalescent or recovered from institutions for the insane is in urgent need of funds to carry on its work of preventing relapse and supervising the convalescence of some of the 7,000 patients who are discharged each year from mental hospitals and asylums. It arranges for medical advice, finds suitable employment, provides necessary outfits, and helps also in various other ways those who would otherwise have to face the world without any friends or resources. Last year more than 900 cases were so assisted, the majority of whom have done exceedingly well. Contributions will be gratefully received by the secretary, Miss Vickers, Church House, Dean's Yard, Westminster, S.W.1.

MIGRAINE AND CALCIUM LACTATE.

"J. B. S." writes: Dr. A. Douglas Bigland's interesting article (December 15th, p. 1153) on the treatment of migraine by calcium lactate brought back to my memory a rather unpleasant experience I had with this drug. For some considerable time I have been the subject of repeated attacks of what I myself consider migraine, although the symptoms do not correspond exactly with textbooks. In my case I have only the dull headache and sickness. Now about two years ago I tried calcium lactate, not for the migraine, but as a "blood tonic," taking 10 grains three times a day; and one day, while methodically and conscientiously finishing my second bottle, I experienced a severe attack of migraine, starting with visual phenomena (zigzag lines and balls of light before the left eye), and finishing up with dizziness and a diabolical headache on the right temple. This attack was the first I had had with eye features, and I attribute the severity to the calcium lactate, because I have since then attempted to take the drug with almost similar, although not quite so marked, results.

DIET TABLES AND FOOD VALUES.

THE aim of Dr. E. P. Poulton in his *Diet Tables and Recipes for Diabetics* (London: J. and A. Churchill. 1923. 1s. net.) is to place in a short and compact form some facts which may be useful to patients suffering from diabetes when they are carrying out their own treatment under the supervision of their medical advisers. The publication is opportune, since the introduction of "insulin" treatment has rendered precision in diet measurements far more imperative than ever before. We have found them most useful, and they help the patient to carry out instructions with ease and accuracy. Once the appropriate fat, protein, and carbohydrate content of a diet has been determined for an individual patient, these tables will enable him to choose and vary his daily meals with safety and enjoyment.

We have also received a pamphlet containing *Tables of Food Values* compiled by Drs. Smith and Miller of Harrogate (Belfast: R. R. Browne and Co. 1923. 1s.). The tables indicate the weight in grams of carbohydrate, protein, and fat contained in one ounce of the article of diet, together with the calorie value. A very large range of foodstuffs is included, so that with a little practice an intelligent patient can arrange meals which may be varied and attractive.

Yet as we look through food tables arranged for British patients we reflect how much they add to the pain and grief of their illness by attempting to weigh diets in ounces and pounds. They might be better advised to buy a set of gram weights and thus add to the length and ease of the years that remained to them.

A CORRECTION CORRECTED.

SIR JAMES YOXALL (General Secretary of the National Union of Teachers) writes: I read in your issue for December 8th that Sir Robert Armstrong-Jones has been caused "much annoyance" by a statement made in the report of a lecture delivered by him "before the National Union of Teachers." The lecture was delivered before students belonging to the People's League of Health, and not before the National Union of Teachers. This Union places a room at the disposal of that League for a series of lectures each winter, but the proceedings and the report of the proceedings are not under the control of the Union. I write to correct a misapprehension, and not in the least to belittle the work which the People's League of Health is doing.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 29, 31, 32, and 33 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 30 and 31.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 280.

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